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A BRIEF REPORT OF THE FIRST TWO YEARS' WORK IN THE PHIPPS DISPENSARY FOR TUBERCULOSIS OF THE JOHNS HOPKINS HOSPITAL.

By Louis Hamman, M. D.

The Phipps Dispensary of the Johns Hopkins Hospital, established through the generosity of Mr. Henry Phipps, was formally opened on February 21, 1905, and the first patients received on March 1 of the same year. The work has gradually increased in extent and grown in usefulness. During the first year 639 patients were registered; during the second 835, and from two physicians and a nurse, the staff has grown to ten physicians and still only one nurse, but by joining forces with the two other tuberculosis nurses in the city, the work of the nurse has developed in a most satisfactory and valuable manner.[1] With the gradual increase in assistance, it has at last become possible to begin in an humble way plans which were from the beginning hopefully formed, but which could not be carried out on account of the great amount of routine work. Much, however, remains to be done, and this report is but an indication of a tendency which it is hoped will gradually branch into a much wider field of usefulness. There are several aspects of the work, which it is best to consider separately.

The main function of a tuberculosis dispensary is the prevention of the spread of the disease, a campaign of prevention by education, by education taken in its broadest sense. We are more and more impressed with the importance of the home as a center of infection and the figures so carefully gathered, which Dr. Hazen will report, are astonishingly corroborative of this fact. It is impossible to follow Koch's suggestion to remove these cases, as the most efficient means at our command to check the spread of the disease, but something at least, can be accomplished by rendering them relatively harmless. It is as useless simply to tell a patient, and particularly an ignorant patient without means, to burn his sputum and use paper napkins, as it is to tell him to go to the country and eat plenty of eggs and drink plenty of milk. In both instances the principles are sound, but to attain results demands an endless and untiring application in detail of the principles. This is the work of the nurses, to follow the patients to their homes, not alone to tell them what to do, but to show them how to do it; to return week after week to see that their instructions are being carried out, and to demon-

[1] There are at present three nurses engaged in the work in the city. Miss Spicer, who is directly connected with the Phipp's Dispensary and is supported through the generosity of Mr. Bloede, Miss La Motte, supported by private contributions secured by Mrs. William Osler, and Miss Bond, supported by the Graduate Nurses' Fund. Their heavy task is best measured by the statement that they have a permanent visiting list of about 700 patients.

strate to them, if necessary again and again, what to do. This is the most important service of a dispensary and its value is so well recognized in Germany that at the tuberculosis relief stations the physicians do little but diagnose the cases, and give general directions for treatment. The painstaking and often discouraging labors of the nurses are performed in such a quiet, unobtrusive way that they frequently do not obtain from the public their due recognition. This is the work that tells, however. Dr. Forster can show that many cases have been cured at Eudowood and that in many patients the disease has been arrested, but it is impossible to show that Miss Spicer's results are still better, for although she has saved many persons from contracting the disease, this cannot be statistically demonstrated. We know, however, that this is a fact. The nurses have been of the greatest assistance in other ways. They have followed the doubtful cases and have insisted upon their return to the dispensary from time to time for further observation, and they have encouraged a large number of patients to come to us for examination who have been or are being continuously exposed to the disease. It is to their zeal in this direction that we owe the discovery of some of our earliest cases.

Education is further disseminated by the patients themselves among their friends, and indeed in their whole neighborhood. One of our patients in particular has carried on an active personal propaganda and has herself brought in 12 others for examination, and among these there have been two early cases. A number of patients who are sleeping out of doors have aroused the curiosity and interest of their neighbors, and it is to be hoped their confidence also in the treatment. The staff of physicians have also assisted in a modest way in the work of education, with encouragement and advice. Many have responded to invitations from the Society for the Prevention of Tuberculosis to speak before various clubs and societies. Certainly a great deal more could be done in the instruction of every medical student here and elsewhere, but the facilities for this are inadequate. Each student should at least be able to make a careful physical examination and to give tuberculin with safety. At present the Phipps Dispensary here furnishes a large portion of the teaching material for the third year students of the Johns Hopkins Medical School. In a small way the work of this Dispensary is being recognized outside of its immediate sphere of activity. The Charity Organization Society frequently seeks its aid and a few physicians send to it their patients for examination and advice. The second important aim of the dispensary is to consider the individual and try to do something for him. During the first year this was necessarily almost entirely disregarded, but during the past twelve months, and particularly during the past six, more and more has been attempted. The first duty in this direction is careful and efficient diagnosis, so that the cases that come to us may be recognized in the very earliest stages and placed at once under proper control. It is remarkable how even advanced cases will improve under proper conditions, but in the dispensary class of patients a return to the surroundings under which the disease was contracted inevitably means relapse. The results are really satisfactory only when the disease is diagnosed early, and as far as our short experience goes, in such cases the outcome promises to be very encouraging. The proper disposition of these early cases has become possible in the past year through the close affiliation of the dispensary and Eudowood Sanatorium. This close association of the two institutions is very gratifying to us, as by its means our sense of responsibility towards these patients is greatly aided. We are seeing more and more early cases, and we feel that we are becoming more and more proficient in diagnosis, especially since we have been able to use tuberculin more extensively.

We are able to do very little for our advanced cases. The only provision made for their care is the City Hospital at Bay View, and many of them refuse to go there. We feel constantly and urgently the need of accommodations for dying patients, not alone as a charity to the individuals themselves, but as the most efficient barrier we have to the further spread of the disease.

We have at last been able, with the aid of more assistants to satisfy a long-felt desire to do something more definite for the ambulant moderately advanced cases and for the early cases unable to find accommodation at Eudowood. In December, 1906, a small class of five or six patients was formed, whose home conditions were to be more vigorously controlled and their whole mode of life more carefully regulated. At the same time, stimulated by the enthusiastic reports of the use of the specific products of the tubercle bacilli, we instructed the patients how to keep careful records of their temperature, pulse, and symptoms preparatory to giving tuberculin injections. In January, 1907, such injections were begun and have been continuously employed since then, only the old tuberculin being used. The class has gradually grown to over 20 members. In this work Dr. Denker has rendered invaluable assistance, giving largely of his time and means in improving the home conditions of the patients. At first the patients records were kept in simple notebooks, more recently copies of the books used by Dr. Pratt in Boston have been furnished the class by Dr. Denker. It is too early to say anything about results, other than to state that a majority of the patients have improved in a most satisfactory manner. Of course there are a good many difficulties in the way. The patients must be selected not only with a view to their personal fitness, but with regard to their home conditions. There must be some foundation to build upon. Many of the patients too do not respond as whole-heartedly to our advice as we wish. It requires much persuasion and encouragement to induce them to accept the necessary routine. Many are still unwilling to do all we ask of them, but we are gradually controlling them better. The influence of one patient upon another is often far more effective than anything we can say or do, and we frequently turn a new member over to the guidance of an old, intelligent pupil with gratifying results. It is too soon to exact that all the details we suggest be strictly fulfilled, but as the work enlarges, we shall be able to demand a rigid adherence as the price of enjoying the privileges membership in

the class confers. We must first of all make such privileges apparent. What do we propose to accomplish by such a plan as I have suggested? It is our intention to treat those patients who cannot find accommodation in sanatoria where advanced cases are usually rejected. Here is a feature in which the home treatment has an advantage over institutional, for the home becomes the sanatorium and the patient, if he recovers, is prepared to live for the rest of his life in a great measure under the same surroundings to which he has long been accustomed. This is a more important matter than it would seem at first glance. The results which have been obtained in the advanced cases at Towson, where they live practically out-of-doors, have been temporarily splendid, but we have seen regretfully relapse after relapse quickly follow the return of these patients to their homes in the city. They have not appreciated that they might follow at home the same life they have led at the sanatorium. We mean to teach these home-returning patients how to practice the same principles they have followed in the sanatorium. We have in our class at present four former Eudowood patients who have had a return of symptoms. Another important object of the class is to spread our teaching through the patients themselves, and thus educate the public still further.

STATISTICS.

During the first year 639 patients were admitted; during the second year 835, giving a total of 1474 patients. Of this number:

956, or 65%, were cases of definite pulmonary tuberculosis;
204, " 13%, were doubtful cases of pulmonary tuberculosis;
245, " 17%, were cases other than tuberculosis;
28, " 2%, were tuberculous cases other than pulmonary;
41, " 3%, of the histories are too incomplete to be considered.

Of the 28 cases of tuberculosis other than pulmonary:

7 are glandular tuberculosis,
7 " pleurisy with effusion,
7 " fibroid pleurisy,
3 " tuberculous peritonitis,
1 is tuberculous pericarditis,
1 " bone tuberculosis,
1 " tuberculous cystitis,
1 " tuberculous adenitis and arthritis.

Of the 245 non-tuberculous cases:

14 had bronchitis and emphysema,
12 " adenoids,
14 " valvular disease of the heart,
3 " lobar pneumonia,
6 " bronchiectasis,
3 " bronchial asthma,
3 " typhoid fever,
2 " Basedow's disease,
2 " empyema,
2 " syphilis,
2 " arteriosclerosis,
1 " pharyngeal catarrh,
1 " nasal obstruction,
1 " carcinoma of the stomach,
1 " chronic interstitial nephritis,
1 had hysteria,
1 " purpura rheumatica,
1 " alcoholic gastritis,
1 " muscular dystrophy,
1 " arthritis deformans,
1 " laryngitis.

In the other cases the examination was negative and no definite diagnosis was made. The large number of doubtful cases is principally due to the frequency with which patients make only one or two visits to the dispensary. Many patients give a wrong address or live out of the city and cannot be followed. Others refuse to return, even when visited by the nurse and urged to do so.

Of the 75 doubtful cases during the first 10 months:

28 came only once,
12 came only twice, and
54 in all paid less than 5 visits.

From the 956 cases of pulmonary tuberculosis the following statistics are compiled:

AGE.

From	1	to	5 years	4
"	6	"	10 "	14
"	11	"	15 "	31
"	16	"	20 "	151
"	21	"	25 "	178
"	26	"	30 "	149
"	31	"	35 "	126
"	36	"	40 "	101
"	41	"	45 "	71
"	46	"	50 "	54
"	51	"	55 "	35
"	56	"	60 "	22
"	61	"	65 "	8
"	66	"	70 "	2
"	71	"	80 "	2

Age not stated in 8 cases.

Thus:

From 21 to 40 years there are 554 or 58.33% of the cases,
From 16 to 45 years there are 776 or 81.85% of the cases.

SEX AND COLOR.

White males	463
White females	287
Black males	121
Black females	85
Males	61%
Females	39%
Whites	78.5%
Blacks	21.5%

NATIONALITY.

Reference is made to birthplace of the parents. Thus under Germans are those whose parents were German, as well as those of German birth.

Nationality not stated in		49
United States	white	194
	black	206
Germans		159
Russians		90
Irish		61
Poles		21
English		10

Austrians	18
Scotch	5
Greeks	4
Norwegians	5
Mauritian	1
Bavarian	1
Lithuanian	3
Galatian	1
Spaniards	2
Canadians	3
Bohemians	9
Hungarian	1
Sicilian	1
French	1
Italians	4

Mixed Parentage.

United States and German	7
United States and Irish	2
United States and Scotch	1
German and Irish	2
German and French	1
Irish and Italian	1
English and Dutch	1

Of the white patients:

27.7% are of American descent,
21.2% " " German "
12.8% " " Russian "
8.7% " " Irish "
2.5% " " Austrian "

All of the Russians and Austrians are Jewish, giving roughly 15 per cent of the white patients as Jewish.

Condition.

(Figures from the second year only.)

Condition not stated	5	
Single	271	= 53.5%
Married	204	= 40.3%
Widowed	31	= 6.1%

Exposure.

FIRST YEAR.	Cases.
History of unusually intimate exposure	44
History of less intimate exposure	102
History of doubtful exposure	53
No history of exposure obtained	228
No data	18

SECOND YEAR.	Cases.
Conjugal exposure	20
Intimate association in immediate family	75
Intimate association with patient outside of family	21
Exposure in workshop	28
Incidental exposure	26
No history of exposure obtained	295
No data	46

TOTAL.	
History of definite exposure in	41.3%
History of very intimate exposure in	18%
No history of exposure obtained in	58.6%

The more carefully a patient's past history is inquired into the more often a definite history of exposure is obtained. Our histories are taken largely by students and other inexperienced assistants and the figures represent a very conservative and probably even a very low estimate. The following figures from the first year are suggestive:

Cases with a tuberculous family history, without history of exposure	18
Cases with history of exposure, definitely without tuberculous family history	55
Family history insignificant, exposure marked	5

The Initial Symptoms.

Cough	574
Hæmoptysis	72
Influenza or a "cold"	53
General constitutional symptoms, fever, malaise, "run down," etc.	67
Pain in chest	52
Pneumonia	19
Pleurisy	10
Typhoid fever	6
Chills and fever	14
Intestinal disorders	13
Dyspnœa	9
Measles	3
Hoarseness	4
Pertussis	3
Enlarged glands	3
Sore throat	3
Bronchitis	1
Dengue	1
Coryza	1
Rheumatism	1
Palpitation of heart	1
After trauma	1
Not stated	42

62.8% of cases begin with cough,
7.87% " " " " hæmoptysis,
7.3% " " " " constitutional symptoms,
5.7% " " " " pain in chest,
5.7% " " " as influenza,
2.1% " " " " pneumonia.

The Occurrence of Important Symptoms.

Cough present in all cases except 25
Hæmoptysis in 467 cases or 48.85%

Digestion { Good 532 / Impaired 340 } or 39%

Sweats { Profuse 78 / Occasional 468 } or 57.1%

Stage of Disease.

Although Turban's scale was made the standard of comparison, the figures for the second year were compiled by so many different observers that they are not more than roughly accurate. If error has been made, it is in too lenient interpretation. Many cases placed in the first stage belong to the second and many in the second to the third. The figures for the first year were compiled by a single observer and have, I believe, been more justly apportioned.

First stage:	First year,		66	Second year,		154
Second stage:	"	"	160	"	"	171
Third stage:	"	"	214	"	"	155
Not stated:	"	"	5	"	"	31

Condition of Patients on Admission.

The prognosis made at the time of the first examination gives some idea of the condition of the patient on admission.

Good prognosis given: First year, 50; second year, 57; total, 107 = 12 per cent.

Doubtful prognosis given: First year, 56; second year, 58; total, 114 = 12.82 per cent.

Bad prognosis given: First year, 338; second year, 330; total, 668 = 75.1 per cent.

No prognosis given: First year, 1; second year, 66; total, 67.

Duration of Symptoms Before Admission.

FIRST YEAR ONLY.

1 to 3	months,	57	cases, or	13.5%
3 " 6	"	90	" "	21.4%
6 " 12	"	80	" "	19.0%
1 " 2	years,	75	" "	17.8%
2 " 5	"	68	" "	16.1%
5 " 10	"	36	" "	8.5%
Over 10	"	14	" "	3.3%

Again these figures are valuable only as general indications. As is well known, the more searching our inquiries are the longer the duration of symptoms will appear. Ignorant patients, and particularly colored patients, date their illness only from the beginning of serious symptoms.

Complications.

(First year only, 411 cases.)

TUBERCULOUS.

Laryngitis	27
Bone tuberculosis	6
Pleurisy	8
Ischio-rectal abscess	3
Meningitis	1
Pulmonary fistula	1
Enteritis	2
Otitis media	2
Sinus over sternum	1
Glands in neck	1

NON-TUBERCULOUS.

Bronchitis and emphysema	9
Pregnancy	6
Mitral insufficiency	1
Aortic insufficiency	0
Laryngitis	1
Insanity	1
Bronchitis	1
Syphilis	4
Herpes zoster	1
Arteriosclerosis	4
Alcoholism	2
Hiccough	1
Hernia	3
Gonorrhœal exostoses	1
Gout	1

Probably many complications have been omitted. Where a large number of men are engaged in making records, many details are sure to be overlooked.

Results.

The patients being regularly visited by the nurses has given us unusual facilities for following them. The results in all cases, whether sent to a sanitorium or remaining at home under good or bad surroundings, are given below. Only so small a proportion entered institutions, however, that the number is practically negligible. The results are given up to May 1, 1907.

I. Cases followed for from 20 to 26 months:

Number of cases of pulmonary tuberculosis in first six months		263
Patients living out of city or lost		63
Number of patients followed	200	
Of these are dead	119	or 59.5%
Of these are living	81	or 40.5%

Of the 81 living: 31 are improved, 27 remain unchanged, 23 are worse.

II. Cases followed for from 14 to 20 months:

Number of cases of pulmonary tuberculosis in second six months		182
Patients living out of city or lost		63
Number of patients followed	119	
Of these are dead	62	or 52.2%
Of these are living	57	or 47.8%

Of the 57 living: 17 are improved, 10 unchanged, 30 are worse.

III. Cases followed for from 8 to 14 months:

Number of cases of pulmonary tuberculosis in third six months		258
Patients living out of city or lost		79
Number of patients followed	179	
Of these are dead	74	
Of these are living	105	

Of the 105 living: 34 are improved, 34 remain the same, 37 are worse.

Totals.—Of 498 cases of pulmonary tuberculosis followed for from 8 to 26 months:

82 are improved	16.4%
71 remain unchanged	14.3%
90 are worse	18.0%
255 are dead	51.2%

Note.—Since this paper was prepared, Mr. Henry Phipps has once more given proof of his broadminded generosity in a gift to us of $1250; $1000 to be used for laboratory work and $250 for the library in the purchase of books and journals on and relating to the subject of tuberculosis. We have been unable heretofore, from lack of funds, to do all the work which we have been eager to do, but shall now be able to carry on investigations which we hope may lead to definite results in the relief and cure of patients suffering from tuberculosis. No class of patients deserves more attention, and to Mr. Phipps, more than to any other American citizen, thanks are due from all, both doctors and laity, for the assistance he has given both here and elsewhere in the relief of these sufferers. It is to be hoped that his example will be followed by others, for there is no more important public work to be done to-day anywhere in the world than to gain control of this disease, which causes a greater loss in lives and money than any other human affliction. We desire, therefore, to express thus publicly our most sincere thanks to Mr. Phipps for his help, and our hopes that in one of his laboratories the long-sought-for cure may be found.—Editor.

THE HOME FACTOR IN TUBERCULOSIS.

A STUDY OF TUBERCULOUS FAMILIES.

By H. H. Hazen, M. D.

There has long been great diversity of opinion as to the part played by heredity in the transmission of pulmonary tuberculosis. As early as 1878 Holden questioned 500 physicians of the United States as to their views upon the inheritability of consumption. In most of the countries of Europe similar investigations were made, but all this work led to no exact results. It brought out merely the divergence in the opinions of medical men. However, a number of investigators were led to careful study of the families with which they came in contact. Lendet and Riffel from their studies came to the conclusion that inheritance played an important rôle in this disease, and to this cause they attributed over 50 per cent of their cases.

Let us now turn to the present views. Baumgarten believes that the disease is transmitted directly from parent to child, either through the sperm, ovum, or placenta, and his adherents call attention to hereditary syphilis and pebrine, so carefully studied by Pasteur, as proofs of the possibility of this manner of infection. Others, as Ogilvie, for instance, believe that the predisposition alone is inherited. They divide this predisposition into two forms, general and local. As an example of the local type Ogilvie claims that the same lung is affected in the child as in the parent. Von Behring thinks that the disease is acquired in early life through the digestive canal and remains latent for perhaps many years, until some favoring circumstance lights up an infection.

At the Phipps Dispensary our feeling is that inheritance plays a very minor rôle, and because of our facilities for the careful study of the home life of our patients, we undertook a careful search into the number of infections occurring in households. Thanks to our Phipps nurse, Miss Spicer, and the two tuberculosis nurses, Miss La Motte and Miss Bond, we have an admirable means to study the home conditions. The family is under a trained eye. Doubtful cases are either sent to the dispensary or examined at home. The material for this paper has been gathered through the painstaking care of these three nurses. Only those families are reported which have one or more members visiting the Phipps Dispensary.

We have studied 83 families, containing a total of 534 individuals. Of these 254, or 47 per cent, are definitely tuberculous, 13 are suspicious, and only 267 are well. At first glance this might seem to speak for heredity, but a moment's thought will show that the intimate contact with members of one's own family furnishes the best possible chance for contagion.

In 48 instances we find at least one child and one or both of the parents infected. Of these cases both parents are infected in 10 instances; the father alone in 12, and the mother alone in 26. The fact that we find mother and child infected more frequently than we do the father and child is easily explained by the necessarily closer contact with the mother. Again, these figures seem to speak for heredity, but let us examine a little further. In three instances in the above series the child developed the disease well in advance of the parent. In 17 instances we find one or more children infected and both parents entirely free from the disease. Out of our total of 254 cases we find 158, or 62 per cent, free from an hereditary taint. The objection may be made that the history was inaccurate; and we must admit that in spite of our utmost care we may have been misled.

Is there the possibility of contagion between individuals who are in as intimate contact as in family life, and in whom hereditary transmission from a common source can be ruled out? We naturally turn to man and wife. What do our figures show? We find 21 instances of conjugal infection, and two instances in which one party has it and the consort is suspicious, and only 25 instances in which one partner has tuberculosis and the other is living and well. That is a most remarkable record. It well illustrates the danger of prolonged intimate contact. And I wish to emphasize the fact that in every case the family history of the consort who last develops the disease is negative. Among our dispensary cases we have several records similar to Weber's, where one man has the disease himself and has lost two or more wives from the same cause; but among the 83 families studied there are no such cases. While speaking of conjugal infections, I must mention a recent report by Weinberg. He has studied the surviving consort in 4000 patients who have died of tuberculosis, and finds that their death rate is just twice as high as that for other widows and widowers. The percentage of infection from husband to wife, or vice versa, is not quite so high as that from mother to child, but is very high, nearly one-half of our married patients having infected their consorts. In two-thirds of our cases a diseased parent has infected one or more children. Of 48 individuals who were exposed by marriage, 21 have contracted the disease and two are suspicious. I have already mentioned that in 48 instances where there was a diseased parent, one or more children developed the disease. In these 48 families there are 237 children, and of these only 92 developed tuberculosis, while five are suspicious. In other words, where one consort had tuberculosis the other developed it in 43 per cent of the cases; whereas of those exposed to parental infection, only 38 per cent developed it.

In 15 instances one or both parents have pulmonary trouble and the children are entirely well.

Of distant relations who have spent some short time with the family, we find but three infected,—a rather small percentage if we consider the family tainted.

In five instances a person coming from a sound family has married into a tuberculous family, the consort not being

diseased, and has developed the disease. Five may not seem a large figure, but it constitutes nearly two per cent of our cases.

And now comes a most important fact. Only three out of 254 members a trifle over one per cent of these 83 tuberculous families, who were not in contact with their families, developed the disease. If we accepted heredity as the most important factor we should look for a larger percentage.

Excluding conjugal infections, we have 11 instances where an individual moved into a house in which lived, or had recently lived, tuberculous patients and developed the disease.

To sum up: In 62 per cent of our cases there is no tuberculosis in the immediate ancestors. Forty-three per cent of those exposed to marital infection became infected; while only 38 per cent of those exposed to parental infection developed the disease. Only three individuals of tuberculous stock developed lung trouble when not in association with their families. There are 11 well-marked instances of house infection. In view of these facts, I cannot help believing that infection acquired by long continued and intimate association plays the only rôle in the transmission of pulmonary tuberculosis. Findel, in Flügge's laboratory, has shown that to certainly infect a guinea pig it must be made to inhale at least 90 tubercle bacilli. A few bacilli have no effect. This is good experimental evidence that to produce pulmonary infection a large number of bacilli must be taken into the respiratory tract. If true of the guinea pig, this is probably true of man, and one can readily see that the liability to develop the disease after incidental contact is but slight.

In conclusion I add the history of one remarkable negro family in which the disease ran through four generations. In order to confirm the diagnoses, I personally examined the family. Millie, the great grandmother, has a healed lesion in her left upper lobe. She had ten children, two are well, one (Kate) is suspicious, and the other seven definitely tuberculous. Kate had three children, two are well, but the third (Irena) is tuberculous. Irena's four children are all afflicted. A total of 13 positive and one suspicious case in one family, all having at some time lived together.

NOTE.—These very striking figures, important and illustrative as they are, cannot be applied without reservation to the whole of our material. The 83 families referred to were selected for study on account of the large number of infections which had occurred in each, and on account of the favorable conditions for observation.—L. H.

THE EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS.

By LOUIS HAMMAN, M. D. AND SAMUEL WOLMAN, M. D.

Early cases of pulmonary tuberculosis may be regarded hopefully from the point of view of cure, but the multiform character of the disease, and its grave course in some instances, make it absolutely necessary for us to diagnose each case as soon as possible, so that a systematic, vigorous, and efficient treatment may be begun in time. While some cases recover without treatment, and others respond readily to treatment, many, although diagnosed in the early stages, cause great anxiety to their physicians, and may even end fatally in spite of the best of care. Therefore, the earlier a diagnosis is made is of the utmost importance, not only to the individual concerned, but to all who are directly or indirectly associated with him. On account, however, of the necessary changes that must be made in the patient's life, many doctors are reluctant to pronounce sentence as it were, unless there is present marked evidence of the disease. We are convinced, on the other hand, that even the slightest changes in the normal physical signs are important, and the records of our Phipps Dispensary have been searched with a view to determine how slight may be the signs and symptoms which may justify one in making at least a tentative diagnosis, and in subjecting the patient to close observation or to the tuberculin test.

After studying the 1745 histories taken in the Phipps Dispensary during the first two years of its work, we find that about 150 may be classed as early. A large number of these may be accurately classed as tuberculosis from the physical signs alone. They all show definite though slight changes in percussion note, modified breath sounds, and the presence of râles. We shall not discuss cases presenting these three physical signs, since there should be no longer any doubt as to the diagnostic value of this combination of signs. There remains, nevertheless, a group of cases in which these three signs were not always associated. All the patients in this group were proved to have pulmonary tuberculosis, either by the presence of tubercle bacilli in the sputum, or by the tuberculin reaction, or by the further course of the disease with the development of a more advanced lesion with definite and indisputable physical signs, the lesion being located at the site where the suspicious signs were found during the early examination.

Sixty-one patients by these means, where the physical examination was not alone sufficient to prove the existence of the disease, were proven to have pulmonary tuberculosis. In some of these patients there was an altered percussion note, in some modification of the breath sounds, in some râles. In many only one of these signs was present; in some but two of them. In none were all three found.

A change of the percussion note was detected in 29 of the 61 patients, or 47 per cent. Râles were heard in 53 per cent. The breath sounds were modified in 61 per cent. In round numbers, then, we may say that 50 per cent represents the frequency of occurrence of any one of the three signs in early cases. It is interesting to note that in fully one-third of these incipient cases, only one of the three signs was present; a changed note in 5 per cent; modified breath sounds in 13 per cent; râles in 15 per cent. The altered percussion note

was sometimes hardly perceptible; the modified breath sound in some instances was only a roughening of the inspiration; and the râles in many instances were indicated by a barely perceptible crackling; in a few but a single click was heard.

In nearly two-thirds of the group a combination of *two* of the above mentioned physical abnormalities were present, the distribution being as follows: altered percussion and râles in 16 per cent; modified breath sounds and râles in 23 per cent; changes in percussion note and breath sounds in 25 per cent. The most frequent combination is that of modified breath sounds with either of the other two signs. Râles, however, form the most frequent single sign.[1]

Tubercle bacilli were found in the sputa of 24 out of these 61 cases, or 39 per cent. A positive tuberculin reaction was obtained in 24 other cases that did not show bacilli in the sputum. In the remaining 13 cases, the progress of the signs leaves no doubt as to the diagnosis.

A surprisingly large number of these patients presented themselves with cough and sputum, 89 and 87 per cent respectively. In 66 per cent the respiratory rate was above 20. Forty-two per cent complained of a loss in weight, but fully half of these knew of no disturbance in digestion or appetite to account for the loss. Chills, sweats, loss of appetite, and impaired digestion occurred less frequently. It was impossible to obtain continuous temperature records of these ambulant patients.

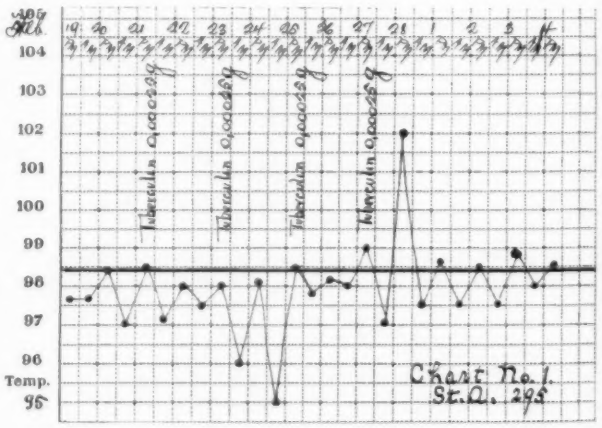
Considering the very early stage of the disease in these patients there is an unexpectedly large occurrence of hæmoptysis—56 per cent; and 16 per cent indicated hæmoptysis as the initial symptom. In order of frequency the initial symptoms are cough, 56 per cent; pain, 22 per cent; hæmoptysis, 16 per cent. A few gave weakness or loss of weight as the primary symptom. It is probable that hæmoptysis is not as often the initial symptom as our figures indicate; for the spitting of blood hurries the patient to the doctor much sooner than other symptoms which appear less grave to the patient. In two cases the lungs were apparently clear, but both had had hæmoptysis and both reacted to tuberculin.

Symptoms are of undoubted importance in the diagnosis of early cases, but not of as much as the signs, except of course that it is the symptom and not the sign that brings the patient to the doctor. We have seen a considerable number of patients without symptoms, who were discovered during the routine examination of the members of families in which there were one or more tuberculous patients. This experience shows how many more patients suffer from this disease than is commonly supposed. Even with all these symptoms, with the exception perhaps of hæmoptysis, the finding of such slight signs does not actually prove the existence of pulmonary tuberculosis.

[1] By a changed note is meant not only an imperfect but also a hyperresonant note; by modified breath sounds, not simply an intensification or prolongation, but also a suppression of them. Our records show diminished movements of the chest at the site of the lesion in more than one-half of the incipient cases, but as this sign is in these cases often difficult to appreciate, we do not lay stress upon it.

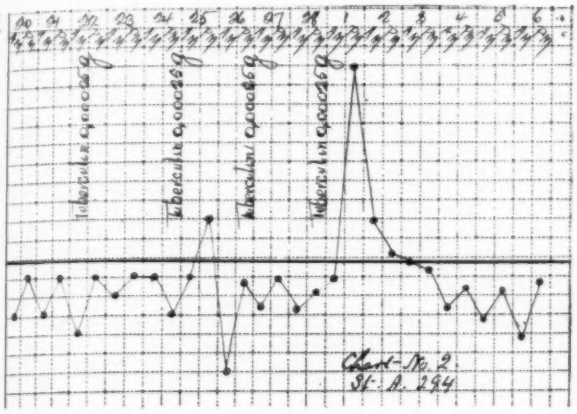
Further observation of the patient's temperature, pulse, weight, and other clinical symptoms and repeated examinations undertaken preferably at different times of the day, with more than one careful sputum examination, are demanded. After all this the diagnosis may still remain in doubt, and it is in this group of cases that tuberculin has rendered an invaluable service. Tuberculin must, however, be used intelligently. When it is used with care there is no danger to the patient, but it is in the interpretation of the results that caution is necessary. Its specificity has been determined beyond doubt, and the only just objection to its use in diagnosis is that the reagent is too delicate and may give a reaction which is easily to be interpreted falsely. It is well to recall the figures of Franz, who injected 400 recruits of the Bohemian army, able-bodied, apparently healthy men, and found that 61 per cent (!) reacted. It is only when the tuberculin reaction is viewed as a part of the whole clinical picture that it acquires importance.

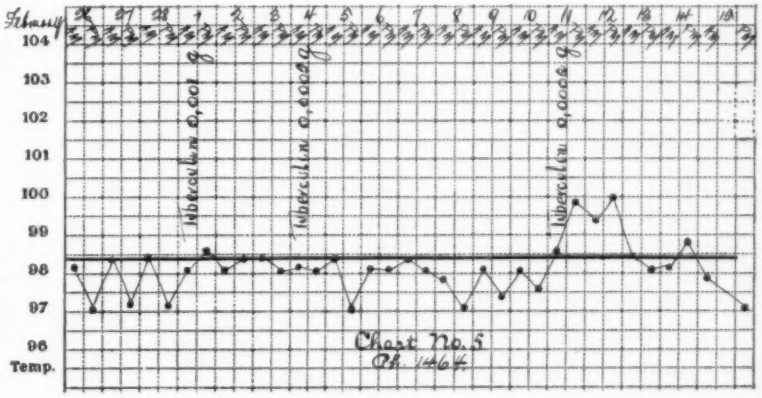
The original directions of Koch to use one, five, and ten milligrammes, and repeat the last injection if no reaction occurs, have recently been interestingly modified. Loewenstein suggested using much smaller doses, a fifth of a milligramme and repeating this same dose four or five times. The principle depends upon the assumption that the tuberculin reaction is due not so much to the dose employed as to the hypersensitiveness developed by the injection of repeated small doses. This principle has become established for the albumoses (?) as a class, and is a well-known phenomenon of serum injections. An animal is often killed by the repetition of a dose which on the first injection was harmless. Charts Nos. 1, 2, 3, and 4 show the typical reactions after repeated

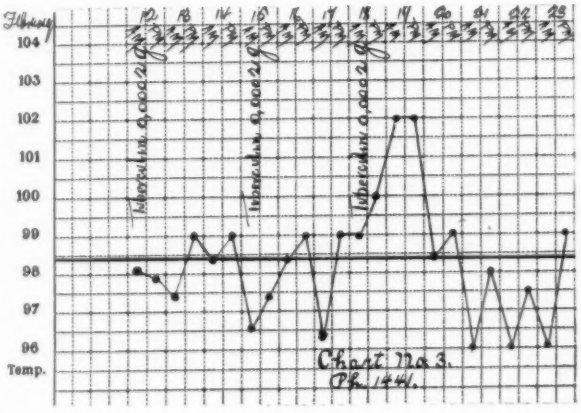


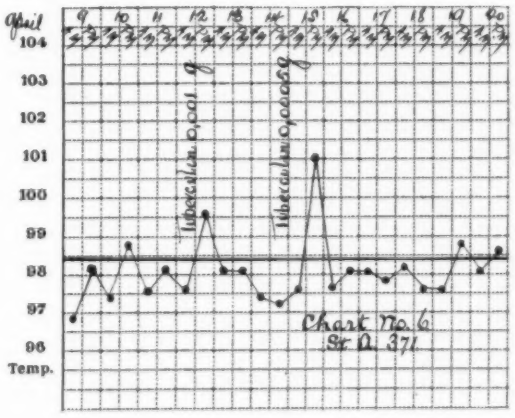
injections of the same small dose. If the principle is true, one would expect a reaction with descending doses of tuberculin, and such reactions do occur. In Chart No. 5 the patient reacted to the third injection, one, one-half, and one-fifth of a milligramme being given. In Chart No. 6 there is a very slight reaction to one milligramme, a most decided reaction to the second dose of one-half a milligramme. These charts emphasize very strongly a caution which was given by Koch

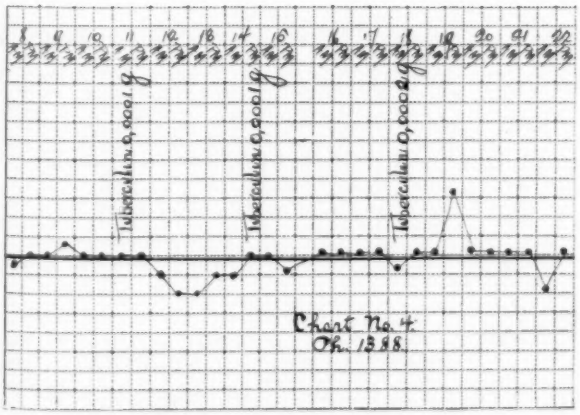
himself, namely, if a patient shows ever so slight a tendency to react to a given dose of tuberculin, the same dose must be repeated before a larger amount is given. Attention to this caution will prevent many unpleasant results. The advantages that may be claimed for Loewenstein's method are that the reaction is milder, and, therefore, its dangers are minimized and that not as many obscure but unimportant (healed?) tuberculous foci are revealed as by the larger doses. The objections to the method are that many cases that fail to react to the small doses do react when larger doses are given, and if we restrict ourselves to a fifth of a milligramme, many cases of tuberculosis will pass undetected and the whole value of the method be compromised. Bandelier and Rolpke particularly emphasize this

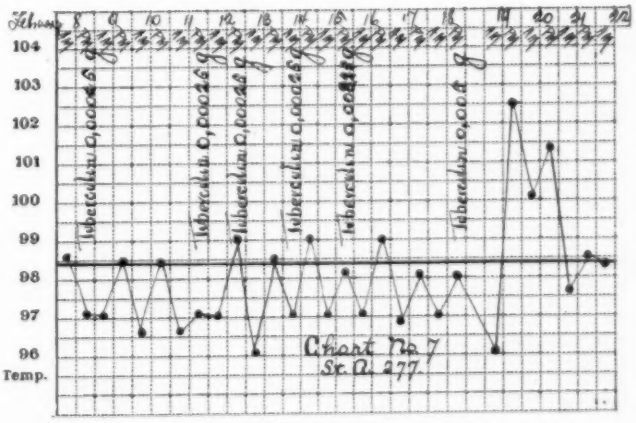




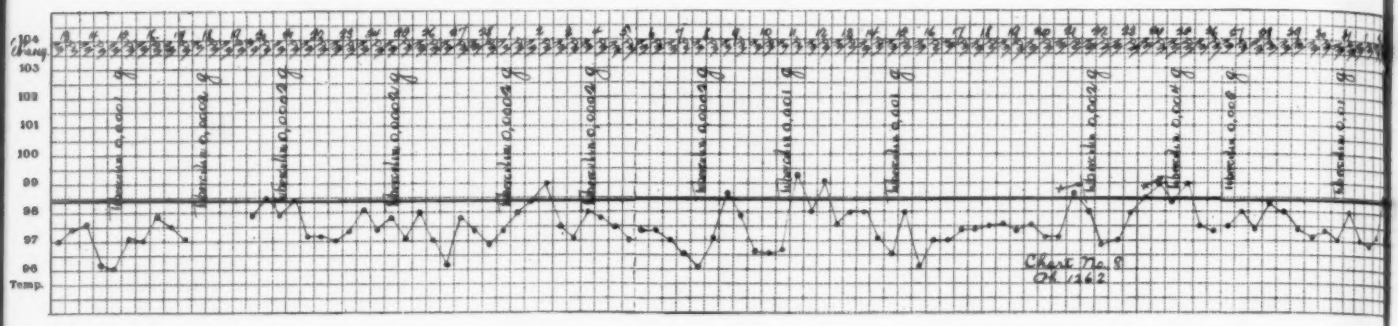


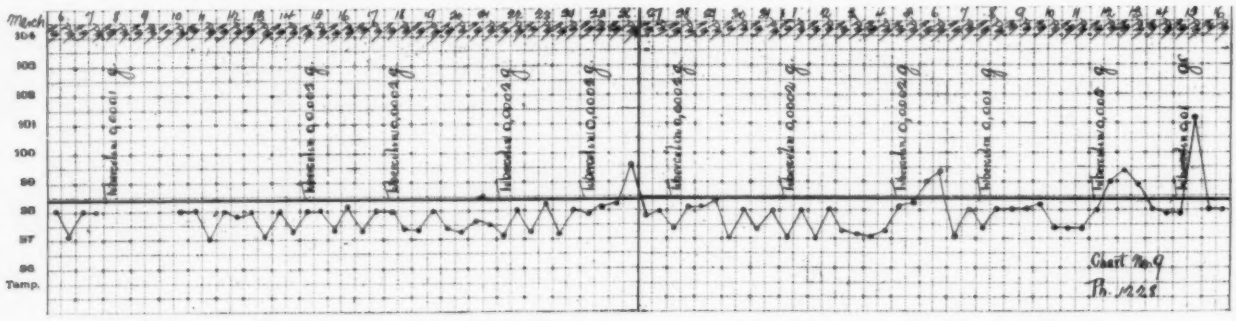






point; which from the report of their cases seems well justified. Chart No. 7 shows a marked reaction to five milligrammes after repeated injections of a quarter of a milligramme were unavailing. Although repeated small doses do develop a hypersensitiveness, it is well known that if great obstacles in the way of a correct interpretation. We have no special formula to suggest, but we feel that to repeat a fifth of a milligramme dose three or four times and then ascend rapidly to larger doses, as one, five, and ten milligrammes is a particularly safe method in ambulant cases.

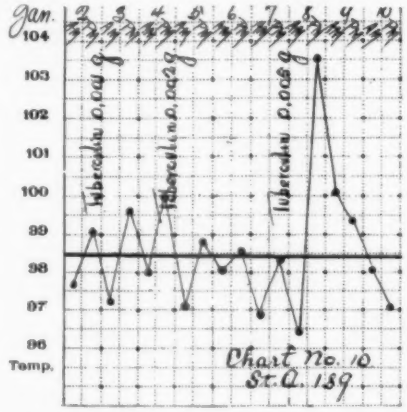




repeated frequently enough, an immunity is developed, and by giving too many small doses we may render the patient insensitive to larger doses. Several of our charts offer this suggestion, but of course the interpretation is uncertain. In Chart No. 8, after a very slight reaction to the small dose, no further reaction appears, even when ten milligrammes is given. In Chart No. 9, after several very mild reactions, there is no further reaction until ten milligrammes is given. The third objection to the method is that it is time-consuming, which of course is invalid if it is proven that it has any decided advantages.

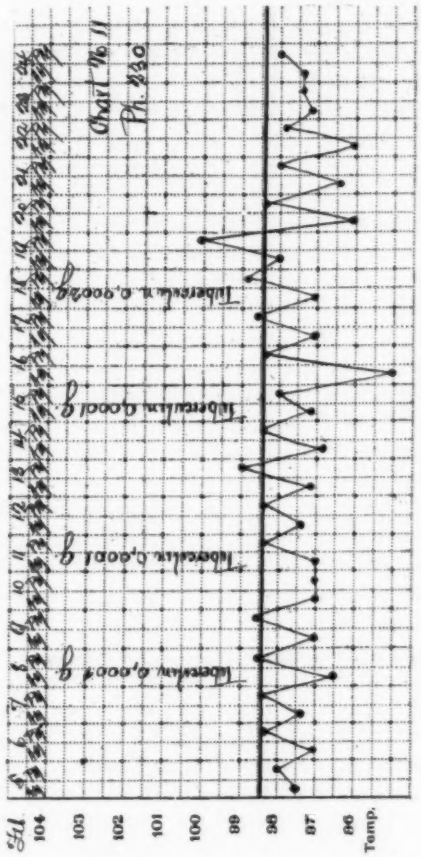
Another much discussed point is the maximum dose. Is it necessary to give as much as ten milligrammes, or wise to repeat this dose, as Koch advises? Bandelier in a very exhaustive article, insists most strongly upon following accurately Koch's directions. Certainly we have by the old method obtained reactions to ten milligrammes in cases where there could be little doubt of the presence of tuberculosis. In one instance particularly, where the patient did not react until the second ten milligrammes was given, the diagnosis was later confirmed by the appearance of hæmoptysis. Whether such high doses are necessary when preceded by repeated small doses, is questionable. As we have said, it is a disadvantage to have the reaction too fine, but the whole question needs longer and more systematic study. Unfortunately, there are

In the interpretation of a tuberculin reaction three factors must be considered,—the temperature, the constitutional symptoms, and the physical signs. These occur without any definite relation to one another. In Chart No. 10 the temperature is



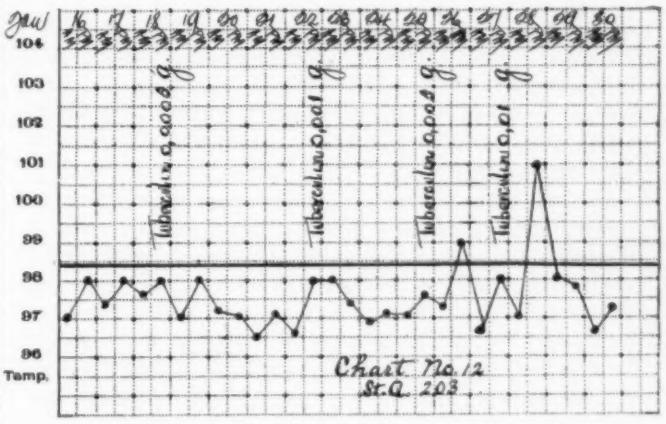
recorded as high as 103 degrees, while the patient has scarcely any constitutional symptoms. In Charts Nos. 4 and 11 the temperature was below 100 degrees and the constitutional symptoms were intense. The third feature, the physical signs of the reaction, is by far the most important, for we then not only know that the patient has an active tuberculous lesion,

but where it is and something about its extent. Although a local reaction must always occur, unfortunately the lesion is seldom so favorably placed that we can detect it. Rolpke reports obtaining signs of local reaction in 45 per cent of his



cases, but this is an exceptionally high percentage. In 30 of our cases unequivocal changes in the local signs were observed in only six.

To summarize then, we may say that a negative reaction is positive information, and information which is often extremely valuable. We recall particularly, one instance in which the symptoms and physical signs were so very suggestive that without tuberculin we should certainly have made a definite diagnosis to avoid the possibility of falling into a graver error. When together with the general and the febrile reaction, there are definite signs of a local reaction, the test is one of the most satisfactory and convincing of all our diagnostic methods. A large group of cases remains, which react positively, where a great deal of care and judgment must be used in our interpretation. It must be remembered that a patient may have a pulmonary disease other than tuberculosis and still react to tuberculin. For instance, Chart No. 12 shows a typical reaction to ten after one-half, one, two, and five milligrammes had been given. The clinical history, the physical examination and the sputum examination make the diagnosis of bronchiectasis almost certain, and while it is safe to assume that the patient has either a glandular or a pulmonary tuberculous lesion, we feel confident that tuberculosis is not the disease causing the symptoms. The tuberculin reaction can in no way replace a careful and painstaking examination, for it is just in those instances, where, after repeated examinations, we have found suggestive signs, that tuberculin finds its most valuable application. It is another bit of evidence added to the history and the examination, and is only of importance when viewed in the light of these. We are willing to admit that relying upon its aid we may send to the sanitorium some patients who would have perfectly recovered had they continued their accustomed mode of living, but no one can say which case of tuberculosis will be arrested naturally, or which one will progress if untreated. It is to-day almost universally acknowledged that the cure of pulmonary tuberculosis has been grossly exaggerated and our only hope for satisfactory results is in the treatment of just such early cases. We feel very strongly that we have done our best duty, even if we condemn needlessly one patient to a year of treatment, if by doing so,



we with certainty completely restore three, or only two, others to perfect health.

In conclusion we desire to express our opinion that in the diagnosis of an early case of pulmonary tuberculosis no abnormality of the physical signs should be disregarded, no matter how unimportant it may appear at first sight. A single click, if it persists after coughing and deep breathing, and especially if it is heard at the same spot on subsequent examinations, should put us on our guard, and arouse us to use all the means we have to make a correct diagnosis—whose importance is inestimable in these cases. Only in this way will it be possible to diminish the enormous mortality and morbidity which accompany this disease, and which are a disgrace to the medical profession, who to-day, more than ever before, are responsible in large measure for the conditions of life resulting from tuberculosis.

THE CRUSADE AGAINST TUBERCULOSIS.[1]

By Lawrence F. Flick, M. D.

From the dawn of history consumption has been the giant foe of mankind, paralyzing all resistance by the majesty of his havoc. Here and there seers of medicine read aright his pedigree and hinted at methods by which he could be exterminated, but their prophecies fell upon dead ears. Not until Pasteur and his followers gave the world the 'magna charta' of emancipation from superstition was his doom forecast; and when Koch discovered the tubercle bacillus in 1882, science wrote his death warrant. Before that time civilization had struggled in vain against the monster.

Since Koch's great discovery wonderful strides have been made in the campaign against tuberculosis. The warfare began with the cry of the forerunners, who shouted the new gospel from the house tops, but as men crying out in the wilderness. They were teaching new and strange doctrine so at variance with accepted views that the world sneered at them as false prophets and decried them as crazed fanatics. So full of hope, however, was the new doctrine and so well embossed with the image of truth that it attracted attention and gradually won the minds and hearts of men and women all over the world. Here and there neophites gathered together, joined forces and pledged themselves to work in unison for the conversion of the world. Societies for the prevention of tuberculosis sprung up everywhere and almost in the twinkling of an eye civilization felt the influence of a new force in the crusade against tuberculosis.

Nowhere in the history of civilization can we find a movement for the betterment of mankind springing into existence so quickly and unostentatiously as has this crusade against tuberculosis. Not with the herald of music nor with the clatter of arms has it come, but with the silence of the recluse; not by the sword at the command of kings, but by the pen of the scientist and alms of the philanthropist. With the force of truth the new word has penetrated the multitude and has borne fruit in action for the amelioration of the sufferings of the consumptive and for the prevention of the disease which afflicts him. Without knowing the why and the wherefore, men and women have been transformed over night from rabid opponents of the new doctrine into ardent advocates of it and in the ardor of their new faith have vied with one another for the accomplishment of practical results. Poor and rich alike are contributing everywhere to the funds for carrying out the work and legislatures the world over are spending money freely for its purposes.

One can scarcely realize that the first society for the prevention of tuberculosis in the world was founded in the city of Philadelphia as recently as April, 1893, when the Pennsylvania Society for the Prevention of Tuberculosis was organized. Almost simultaneously with the organization of this society came that of a similar society in Paris. For a few years these two organizations were alone in the field. The Pennsylvania society sent literature on the prevention of tuberculosis in the form of tracts to all parts of the world; and under the auspices of the French society a journal on tuberculosis was established, which has done much to enlighten the world along scientific lines. Soon societies for the prevention of tuberculosis sprung up everywhere, both in America and in Europe, and wherever they did spring up they attracted the attention and gained the support of intellect and power. With the increase of the number of societies came new journals and new literature of all kinds so that the world was flooded with information upon the subject of tuberculosis from every possible point of view. So extensive has this literature become that it is no longer possible for one individual to keep track of it. Countries, states, cities, towns, and even boroughs now have their local movements, often with their own literature, vieing one with another for the accomplishment of the great purpose of all, the extermination of the great white plague.

Early in the crusade against tuberculosis it was foreseen that some supervision would be necessary to keep the work within proper lines and with this object in view the leaders of the movement in Europe met and organized on international lines. In 1898 the first gathering of this kind was convened in Paris in the form of a congress. Men from different parts of the world met and interchanged thought. A second meeting was held in Berlin in 1899, a third in Naples in 1900, a fourth in London in 1901, and a fifth in Paris in 1905. All of these meetings were called congresses, and while strictly national in organization up to that of 1905, which was international in organization, all were more or less international in character. As a rule they were held under the auspices of the government of the country in which they convened and bore the reputation of official gatherings. Much was accomplished in education at these meetings and the delegates who attended them returned to their homes consecrated with new force and endowed with new energy for the campaign in which they had enlisted.

At the meeting in Naples in 1900, a Central International Bureau for the prevention of consumption was organized with headquarters in Berlin. This bureau is made up of representatives from national associations for the prevention of tuberculosis and constitutes a sort of international society for the prevention of tuberculosis. It held its first conference in 1902 in Berlin, its second in 1903 in Paris, its third in 1904 in Copenhagen, its fourth in 1905 in Paris, its fifth in 1906 at The Hague, and it is scheduled to hold conferences in some part of the world every year. At these conferences papers on the subject of tuberculosis are discussed by scientific men and philanthropists, plans for the prevention of tuberculosis are compared and new plans formulated.

At the Congress on Tuberculosis which convened in London

[1] Read before the Third Maryland State Conference of Charities and Correction, April 26, 1907, McCoy Hall, Baltimore.

in 1901 under the auspices of the English Society for the Prevention of Tuberculosis and the patronage of the King of England, the Royal Family, and the English government, it was decided to make future congresses international in character and in form. An invitation was accepted from the French government to hold the next meeting in Paris in 1904 with the understanding that all governments of the world would be invited to participate through official delegates. Subsequently the date of meeting was changed from 1904 to 1905, and the fifth congress on tuberculosis, being the first strictly international congress, was held in Paris from October 2 to October 7, 1905.

In our own country a successful effort to unify the local movements and co-ordinate them was launched in Baltimore in 1904. The seed was sown at the first tuberculosis exhibition in Baltimore and germinated at a meeting held under the auspices of the Henry Phipps Institute in Philadelphia to hear the paper of Maragliano in March, 1904. The little plant was set in stronger soil at a meeting called for that purpose at Atlantic City in May, 1904. At this meeting the destiny of the crusade against tuberculosis in the United States was finally fixed and a threatened danger of having this grand movement fall into the hands of charlatans was obviated. The National Association for the Study and Prevention of Tuberculosis was organized, and that organization has held two successful meetings in Washington since, one in 1905 and one in 1906. The two volumes of transactions of the society tell forcibly what the society has accomplished since its organization.

The International Congress on Tuberculosis in Paris in 1905 was a great success. Workers in the crusade against tuberculosis convened from all parts of the world, some as the official representatives of the countries from which they came and others as volunteers in the great army of the crusade. Between four and five thousand people registered as adherents of this congress, and whether they came as official delegates or as privates in the ranks, all brought the fruits of their labors and offered them freely on the altar of the common cause. From the North and from the South and from the East and from the West came the wise men and the patriarchs all burning with zeal for the great work upon which they had embarked, and they departed from thence at the end of the congress filled with enthusiasm and burdened with new ideas.

The exhibit at the Parisian congress was a revelation to all who saw it. It demonstrated that the whole world is alive to the importance of the crusade against tuberculosis. From all parts objective displays were made of work done and of the manner in which it is done. There were bacteriological and pathological exhibits which gave a most complete demonstration of the ravages of tuberculosis throughout the animal kingdom and of the manner in which the tubercle bacillus operates to the detriment of mankind. There were carefully prepared statistics showing the damage done by tuberculosis in the past and in the present and exemplifying the benefits accruing from the crusade against the disease. There were exhibits of institutions which have been erected in various parts of the world for treating consumptives in all stages of the disease; of object lessons on sanitation in the interest of the crusade against tuberculosis for practically every department of life, so arranged that they could be studied comparatively; and of mechanical appliances and instruments which are used in one way or another in dealing with the tuberculosis problem in its many phases. In short the exhibit was for the scientific and the philanthropic world what commercial exhibits are for the world of trade. It was a world's fair in science and philanthropy and gave the visitor an opportunity of seeing for himself what the crusade against tuberculosis means in its practical application and of comparing the weapons which have been made for the fight in different parts of the world and selecting for himself those which are most suitable to the place in which he is engaged in the campaign.

One of the surprising things at the congress in Paris was the strength of some of the smaller countries in the crusade against tuberculosis as reflected by their exhibits compared with the strength of the crusade in some of the larger countries. To us of the United States, for example, it was a revelation to find that some of the South American countries surpassed us in the practical application of the new doctrines about tuberculosis to every-day life for the modification of customs and habits. Buenos Ayres, of the Argentine Republic, showed work in the crusade against tuberculosis the most advanced of the Western Hemisphere and perhaps of the world. The United States was poorly represented in its work inasmuch as very few of our states and cities presented their work at all, but had our country been represented at its best it could not have competed with Buenos Ayres. Germany probably led the world in its exhibit, as it leads the world in the crusade against tuberculosis.

At this meeting in Paris the congress was invited to come to the United States by our National Association for the Study and Prevention of Tuberculosis, the invitation receiving the personal endorsement of President Roosevelt through Ambassador McCormick. The invitation was accepted and the next session of the congress was fixed for 1908, the place and date being left open for settlement by the National Association. An invitation was extended at the same time to the Central International Bureau for the Prevention of Consumption to meet in the United States at the time of the meeting of the congress and this invitation was likewise accepted. Acceptance of both invitations was not only unanimous but most hearty, foreboding successful meetings for both organizations in the United States.

The National Association has selected Washington as the place of the meeting of the congress; has tentatively fixed the time of meeting between the last week of September and the second week of October, 1908; has adopted general plans for the congress; and has appointed a committee on the congress with full power to act. Preliminary work has been done by this committee and some of the machinery for the congress has already been created. The committee is endeavoring to raise a fund of one hundred thousand dollars from private

sources for the defrayal of expenses of the congress and has thirty thousand dollars of this fund in hand. An office has been opened at 810 Colorado Building, Washington, D. C., and Dr. John S. Fulton, of Baltimore, has been installed as secretary-general of the congress. Dr. Fulton's administrative ability and wide grasp of the general subject of preventive medicine as demonstrated in the past make his selection for the position of secretary-general ominous of success for the congress.

The thirty thousand dollars which has been contributed towards the fund for the congress has been given by six philanthropic men, each of whom has given five thousand dollars. It is believed that fourteen other far-seeing, public-spirited citizens can be found to contribute the balance of the fund. Those who have given, have given with a promptness and heartiness most encouraging and most inspiring. This example will undoubtedly be followed when the subject has been properly brought before the public. Millions of dollars have been contributed in the past by far-seeing citizens for the advancement of commercialism through fairs and exhibits, and the claims which an enterprise of this kind makes upon a man of wealth so far surpass the claims of mere commercialism that one cannot doubt the willingness of men to support such an enterprise. Men who can afford to give need but be informed of what the undertaking means to be induced to give lavishly all the money that is needed.

The fund of one hundred thousand dollars which is to be raised from private sources is to be used for the advancement of the scientific and philanthropic part of the congress only. Expenses for the entertainment of delegates are to be met in other ways. If the congress is to be put on as high a plane as is contemplated by the committee, it will take all of the hundred thousand dollars for the scientific and philanthropic part of the work. A course of thirty lectures by the most prominent workers in the tuberculosis cause throughout the world outside of the United States is to be provided for out of this fund with honoraria to the lecturers commensurate with their dignity. Other expenses to come out of the fund will be those for the creation of machinery for the congress; for buildings necessary for the exhibit; expressage on foreign exhibits both ways; installment and removal of exhibits; supervision and care of exhibits while the congress is in operation; the equipment and direction of the congress while in session with all clerical, page and janitor forces necessary; printing, stationery, and postage for the preliminary work of the congress and for the congress itself; translating, editing, and distributing the transactions of the congress; and official expenses of the secretary-general with all the clerical force necessary for his work during a period of nearly two years.

Steps have already been taken by the committee on the international congress to secure the co-operation of the United States government and of the various State governments. The secretary-general has done much preliminary work in this regard and the prospects of having the co-operation of our governments are very good. The United States and the various States of our Union will be expected to make appropriations to cover the expenses of their own exhibits and of their participation. All foreign governments will likewise be invited to participate, and most of them, no doubt, will defray the expenses of their own exhibits. The congress, however, will have to stand prepared to meet such expenses as will not be met by invited guests who participate in the congress. So far everything has been planned on a broad basis with a view of giving an impetus to the crusade against tuberculosis in this country and throughout the world. For the purpose of promoting activity prizes will be offered in various fields of work in the crusade to be awarded during the congress. One such prize has been announced, and others will be announced in the near future.

Since the organization of the National Association for the Study and Prevention of Tuberculosis in 1904, great progress in the crusade has been made in the United States. Societies for the study and prevention of tuberculosis and for the establishment and maintenance of sanatoria have sprung up everywhere. In many states, hospitals, sanatoria, and dispensaries either have been established or are under construction. Some of the larger cities have made provision for their consumptive poor and others have the subject of making such provision under advisement. There is activity everywhere and most of it is well directed. We are perhaps not as well organized as some of the European countries, especially Germany and France, but our movement is a live one and contains all the elements of success. In some things our work surpasses that of any other country, and there is reason to believe that if we will organize ourselves a little better and bring our work under a little better control we can confidently enter the race for the extermination of tuberculosis with fair prospects of winning out.

In the matter of general education on the subject of tuberculosis and of the application of modern knowledge for the treatment of tuberculosis the United States probably surpasses any country in the world. The American people are a reading people and newspapers have done much in helping spread the modern knowledge about tuberculosis. We also are a very practical people, and the new knowledge has been applied in the treatment of tuberculosis exceedingly well. Our educational methods, however, have not been without pernicious influence. Teaching the people at large through the newspapers is a quick way of educating them, but it is inaccurate and often leads to error and false impressions. In some regards the pendulum has swung too far and our people have been thrown into consternation by exaggerated views. This is particularly true of the contagiousness of tuberculosis. We have not yet recovered from the shock of discovering consumption to be a communicable disease and the majority of our people are still suffering from the hysteria into which it has thrown them.

One of the most urgent needs of the hour in the crusade against tuberculosis is reassurance of the public in the matter of danger from tuberculosis. We must educate the people about the true nature of the contagiousness of tuberculosis, but upon correct principles. Consumption is a contagious disease in that it is implanted by contact with a person who

has the disease or with a place or thing which has been in contact with a person who has the disease; but contact can be made harmless through the intelligence of the parties concerned. Moreover, not only is contact with person, place or thing necessary, but that contact must be prolonged, intimate and by a person with some susceptibility. Mere casual, temporary contact under proper sanitary environment does not give an implantation. The medium of contagion of tuberculosis is gross in character, easily seen and easily controlled, and for this reason the contagiousness of the disease can be obviated by intelligent co-operation between the person who has the disease and the person who is in contact with him. The contagiousness of tuberculosis exists, but can be nullified by the observation of simple rules. For practical purposes consumption can be made noncontagious, and a full knowledge of this fact by the public at large will quiet all fear.

There probably is no more important task before us at the present stage of the crusade against tuberculosis than teaching every man, woman, and child the methods by which a consumptive can be made harmless to others. There are various methods, all of which have for their object the destruction of the tubercle bacilli given off by an infected person before they can be implanted in another. Methods differ somewhat, consistent with efficiency, but the principle underlying all is the same. The simpler and more economical the method the better, if for no other reason than that of universality of application. When all follow the same practices there is less likelihood of misunderstanding and dissatisfaction.

Perhaps the simplest and most economical method so far introduced is: To deposit all sputum, when the lungs are affected into a paper sputum cup which can be held close to the mouth; to wipe the mouth carefully after each expectoration with a paper napkin, fold up the paper napkin and deposit it in a paper bag; to hold a paper napkin before the mouth when coughing, fold up the paper napkin and deposit in a paper bag; burn the paper sputum cup, disinfect the metal holder of the sputum cup, if a metal cup has been used, by boiling, and burn the paper bags containing the napkins; and when the broken down tuberculous tissue is given off from some other part of the body than the lungs to carefully gather it up with absorbent cotton, deposit it with the cotton in a paper bag and promptly burn the bag and contents. Disposal of sputum or broken-down tissue must be prompt, exact and without contamination of anything. If possible, all sputum should be burned and all things which have been contaminated by it should likewise be burned, but if this cannot be done it should be sterilized with a germicide powerful enough to do this and all things which have been contaminated should be sterilized. Before sterilization the sputum should be completely macerated with lye or some strong alkali capable of macerating it. Men who expectorate should not wear beards and above all should not wear mustaches. Everyone who has to do with expectoration either in giving it off or in handling it should be extremely careful not to soil the hands. All people who expectorate should at all times carry with them the material necessary for proper disposal of sputum. Men should carry paper pocket sputum cups, paper napkins and paper bags in their pockets, which they can do very conveniently and women should carry them in hand bags.

An item of education of very great importance at the present time is the proper disposal of expectoration of every kind. Our new ideas about disease must be engrafted upon our social customs. People must be taught to look favorably and approvingly upon practices for the prevention of disease which have to do with spitting. It will be a happy day for civilization when careless expectoration of matter of any kind from the respiratory tract will be placed in the same category as indiscriminate deposit of excreta, which long since has been banished from civilized life. The person who uses a pocket sputum cup for expectoration in public and openly practices measures for the prevention of disease should be looked upon with favor and approval and not with scorn and contemnation. As things now are the consumptive who openly does what is necessary for the protection of others is feared and avoided, while the consumptive who follows practices which endanger everybody about him, but which are in harmony with custom is intimately met and caressed. Of course all of this is due to ignorance and blind reliance upon the past. The use of paper pocket sputum cups for expectoration in public not only by consumptives, but by all who expectorate should be made a social custom, disregard of which is punished by social ostracism. Expectoration is the means of distribution of many other diseases besides tuberculosis and probably has more to do with human ills and human unhappiness than any practice indulged in by man. When the public once realizes this and fully appreciates the protection which an enforced custom of proper disposal of sputum would give, such disposal will be universally established.

Another matter for public education at the present time is the proper disinfection of places and things which have been contaminated with tuberculosis. Could every consumptive be brought under control and made harmless to himself and others, contamination of places and things could not take place and disinfection would be unnecessary. At the present time this is impossible. In fact as society is now organized a relatively small proportion of consumptives are made harmless. There has been a strong opposition to governmental control of consumptives by the medical profession as a body on the plea that the family physician is entirely competent to deal with the problem. The correctness of this plea is not borne out in practice. The family physician gives general instructions about tuberculosis, but does not go into the details necessary for control. I have yet to see the first consumptive who has been brought under discipline, which will make him harmless to others, by the family physician. To tell a man to take care of his spit without telling him exactly how to do it usually means that he spits carefully into a handkerchief, smears his lips and hands with the sputum, soils his clothing with the soiled handkerchief, and contaminates himself and everything about him, or that he spits into some dark place where the sputum is not seen, into a coal scuttle, into the fire in the kitchen, into a spittoon, or on the street, and by any or all of

these methods contaminates his environment as well as himself. No one can spit out without contaminating his own clothing because he is bound to spray some of the sputum upon himself. Instructions which lead to improper practices are worse than no instructions at all, because they carry with them a certain idea of safety and protection which throws people off their guard.

For proper disinfection of places and things contaminated by tuberculosis the first thing necessary is accurate registration. To this men are constantly objecting strenuously for various flimsy reasons, which look strong because they are based upon sentiment and preconceived notions, but which will not bear the light of truth. Now that everybody believes tuberculosis to be contagious, it is absurd to try to hide the person suffering from the disease from the public. If there is danger in tuberculosis, then we should have that danger as open as possible in order that we may protect ourselves against it. Of all things the most to be feared is a hidden foe. It is very probable that much of the unreasonable fear against tuberculosis existing at the present time is due to a general feeling of uneasiness on account of lack of public control. In our free government we mutually agree to permit the government to do that which we as individuals cannot do without trespassing upon the rights of others. In the matter of contagious diseases we realize that we cannot protect ourselves without seriously infringing upon the rights of others, and we cheerfully entrust this whole subject to the government. Did the government know of the whereabouts of every tuberculous subject, and by proper instruction and assistance make every tuberculous subject harmless as, theoretically at least, it can do, there would be no occasion for fear, and the public fear would soon be allayed. The first step necessary for this public control is registration, and agitation for a complete registration of tuberculosis must be kept up until every case has been propely recorded.

With proper registration of tuberculosis disinfection of all places and things which have been contaminated is made possible and should be enforced. Where the government can satisfy itself that practices have been followed which have completely obviated infection, disinfection is unnecessary and need not be insisted upon. Where there is any doubt, however, as to the correctness and efficiency of the practices which have been followed, disinfection of places and things should be carried out by the government or at least under a general supervision of the government by private individuals. Inasmuch as disinfection of places and things which have been contaminated by disease is a very large, extensive project, it might be well for governments to lay down general principles, and in many instances permit individuals to carry out the disinfection upon these principles. In this way every druggist in the land, for instance, might be made an agent of preventive medicine, and a useful field of activity for the druggist might be thus established. No house which has been occupied by a consumptive should be leased to a new tenant without a certificate of health and no thing which has been handled or used by a consumptive should be permitted to be given or sold to another without a certificate of freedom from contamination. If these practices were once introduced their general adoption would become easy. As matters now stand, society has not equipped itself for practical protection against tuberculosis and because of this lack of equipment even those who do understand the subject and are willing to do what is necessary for the protection of themselves and others are unable to carry out the necessary practices in every detail in daily life.

Other subjects bearing upon the prevention of tuberculosis about which the public needs to be educated are ventilation, cleanliness, and sanitary conditions of every kind. The world has made great progress in sanitary science and modern life in large cities has been made possible by reason of this progress. Drainage, sewage, water supply, and heating have been much advanced by modern thought, and the progress along these lines during even the last half century has done much for the prolongation of life and for human happiness and usefulness. Much remains yet to be done even in the vanguard of civilization. Ventilation has not quite kept pace with the other branches of sanitary science, and this is the part of sanitation which most concerns the crusader against tuberculosis. Of all diseases, tuberculosis perhaps more than any other, depends upon contaminated air for its progress. The popular mistaken idea that low temperature is an etiological factor in the production of tuberculosis probably has been and is a serious stumbling block in the way of progress in matters of ventilation. Not only should the public be enlightened upon all of these subjects, but that enlightenment should be made efficient through city ordinances and state laws in building operations, laying out of streets and management of public works. Principles governing the prevention of disease should be incorporated in all new legislation and engrafted upon all old legislation. The protection which the law now gives to the employee and to the individual against bodily injury from physical force should also be given against injury from micro-organisms, setting up pathological conditions in the body when these micro-organisms are spread through carelessness and disregard of sanitary laws. Schools, churches, public places, and institutions of all kinds should be brought under the influence of advanced sanitary science.

Further matters which are of primary interest in the crusade against tuberculosis at the present day are sanatoria, hospitals, dispensaries, convalescent farms, day camps and consumptive colonies. By modern methods of treatment much can be accomplished in the cure of tuberculosis, particularly during the early stages of the disease. Every tuberculous subject who is still in a curable stage should be given an opportunity for recovery, and if his home environments are not such as to make recovery at home possible, provision should be made for his treatment in a sanatorium. Sanatoria, both private and public, should therefore be established all over the country. Many cured consumptives are going into the sanatorium business as a commercial enterprise, and all of these should be encouraged. Sanatoria for people without means should be established by state and city governments

and by private corporations. The public is ready to support such institutions.

For those cases which are advanced beyond recovery, hospital accommodations should be created both for the poor and for the rich. It is difficult to give a dying consumptive all the comforts and alleviation which he is entitled to, with proper protection to others, in the home. In the hospital where everything is arranged and equipped for the advantage of the stricken one, and where every employee is trained to work for the comfort and happiness of that individual all the protection necessary for the well can be given consistently with the greatest amount of comfort and happiness to the afflicted, and without in any way trespassing upon his sensitiveness. For the poor, hospital provision is absolutely necessary in the interest of humanity. As things now are, the poor consumptive ordinarily dies under environments entailing mental and physical suffering which our present day civilization deems unfit for dumb brutes. Moreover, the last few months of the consumptive's life are filled with danger to all those who come under his immediate environment, which can be avoided by removal of the patient into a hospital.

Dispensaries are undoubtedly one of the most potent measures for good in the crusade against tuberculosis at our command. A well conducted dispensary supplies all the conditions necessary for recovery of very early cases of tuberculosis and gives the entrée into the homes of a great many consumptives for efficient educational purposes. Dispensaries can be conducted very economically, at an outlay of not over eight cents per patient per day, and for this reason are available when more expensive measures cannot be afforded. The dispensary might well be made the beginning of the crusade in every community, as it gradually leads up to other more pretentious measures and educates the public for them.

Convalescent farms, day camps, and consumptive colonies can be placed in the same category and are measures which have more to do with the preservation of the health of those who have been restored than with cure and prevention. The average poor consumptive when restored to health is not again able to enter into competition for making a living with people who have never been afflicted with the disease and therefore needs some assistance in his efforts to maintain himself. The convalescent farm is most available and desirable for the patient who has just been discharged from a sanatorium, as it enables him to remain under supervision and direction with an opportunity of earning a little money for a time longer. Day camps are perhaps most adaptable to dispensary patients. The chances of recovery of many dispensary cases could be enhanced by temporary life in day camps, especially such cases as are too far advanced in the disease to follow an occupation. The home environment of such cases is always bad because it is depressing and unsanitary. Consumptive colonies are still on probation, and we are as yet unable to say much about them. They have been tried on a small scale and apparently give satisfaction. Theoretically, there is this to be said in their favor that they give conditions for the pursuit of happiness on the part of those who have been afflicted with tuberculosis which have at least a sympathetic setting and which do not prejudice the interests of those who are thus afflicted.

The crusade against tuberculosis as developed so far, as may well be deduced from what I have already said, is an active campaign in the flush of victory with implements of warfare at hand suitable and well tried. The lines of battle have been drawn, and it is merely a question of soldiers to fight the battle to a finish. The purpose of meetings of this kind is to gather in recruits and send them to the front. Every community now has its recruiting stations, and is doing all in its power to further the campaign. May we not confidently look forward to victory?

THE TUBERCULOSIS SITUATION IN MARYLAND.[1]

By HENRY BARTON JACOBS, M. D.

In the progress of any movement, it is well from time to time to stop and look about to see where we are, how our work looks in perspective, and then to glance ahead to be sure we are on the right road, what the possibilities for future development are, and in what new direction our endeavors should lie.

The present occasion gives me opportunity for just such reflection upon the tuberculosis movement, a movement for man's relief and betterment which is without a parallel in the world's history in its universality, its enthusiasm, and its hopes, a movement, perhaps, which is bringing the people of the world more closely together in common bonds of interest than any other single force which has ever been inaugurated; for it is a cause which appeals not merely to a few of each country, but rather one which is linked particularly with the interests of the great body of workers of the world, the poor people, wherever gathered together.

We deplore wars, we deplore famine, but, years in and out, neither of these awful agencies is so destructive to the race as is this terrible minute enemy, the germ of tuberculosis, which so silently, so secretively, yet so surely decimates, yes doubly decimates, the population of the world.

But to-night I want to review our work here in Maryland to consider what has been done and what next we need to do. This conference gives me a favored opportunity, for I feel that all who hear my voice are sympathetic and eager to do their part in helping on our cause—not only in influencing the public mind, but also in determining municipal and state legislation.

[1] Read at the Third Maryland Conference of Charities and Correction, April 26, 1907, McCoy Hall, Baltimore.

The position of Maryland in this warfare against tuberculosis is already an enviable one. Not only have we had for years public-spirited citizens who have given their best thoughts, and large donations, to a study of the work, but we have had also two or three successive legislatures and two successive governors displaying a wisdom in the form of laws enacted and approved which in some respects puts Maryland in the very vanguard as regards the state and municipal control of the disease. A short enumeration of the work done by private citizens and a brief reference to these laws now on the statute books will not be out of place.

The very first effort in Maryland to do something for the relief of consumptives was made by a devoted band of men and women some ten years ago, who opened a home exclusively for poor people who should be afflicted with consumption. No charge was made for treatment and no one was expected to pay. This was the beginning of what is now The Hospital for Consumptives of Maryland, with its growing sanatorium at Eudowood. I speak of this institution with a great deal of respect, not only because it was the first institution of its kind in Maryland, but because it was one of the first in the country; perhaps its open-air sanatorium, conducted by private charity exclusively, for the tuberculous poor was the very first in this country. Its beginning was small, but it has now come to be an important factor in the community in offering relief to favorable cases among the indigent.

In the past year, an average of 40 patients per day has been maintained, and 139 different individuals were given care, many of them to return to their homes in renewed health, capable of self-support, and many others in an improved condition, capable of caring for themselves in such a way that they no longer are a menace to their family and friends; while still others were made as comfortable as possible in their journey to and across the dark river of death. But the influence of this sanatorium at Eudowood is not to be measured by the number of patients it has treated, for each one of those who have left it has gone out as a missionary more or less intelligent and active according to his or her capacity. Innumerable friends of patients have visited there, and have seen, whether convinced or not, the manner of complete open-air life, and their testimony cannot but have been and be a force in the right direction.

Coincidently with the progress of the work at Eudowood other creditable factors for relief have appeared in our midst. The Phipps Dispensary of the Johns Hopkins Hospital, founded by the generosity of Mr. Henry Phipps, has for two years been devoting its energies exclusively to aiding poor ambulatory patients afflicted with tuberculosis; over 1500 different individuals have been seen and given such assistance as possible—some to be recommended to Eudowood, others to undertake the open-air life as far as possible in their own home; while all have been advised as to the nature of the disease and how to prevent its spread. This advice and this oversight of patients have been extended to the families of the sufferers through the generosity of Mr. Victor G. Bloede, who has maintained a nurse whose duties were to follow up every patient applying for treatment at this dispensary, and in the patient's home to do whatever willing and sympathetic hands might find to do to relieve conditions there and provide against further transmission of the disease. The amount of good accomplished by this single agency, the dispensary and its nurse, cannot be estimated. A similar dispensary has more recently been established at the University of Maryland, and, within a few months past, another on North avenue.

Maryland has been fortunate in having at the head of its public institutions men of progressive minds eager to take advantage of whatever was new in ameliorating the condition of those under their care. At Sykesville, in the Springfield State Insane Hospital, Dr. Clark has introduced the open-air care of consumptive patients; Dr. Wade has done the same at Spring Grove; and thus these two institutions can be said to be important factors in the elimination of tuberculosis and in exerting an educational influence upon the minds of friends and visitors. It was a source of great satisfaction to learn from an expert in tuberculosis who had recently visited other state institutions that the spirit of the times has impregnated them all and, so far as it was possible for those in charge to arrange it, the victims of consumption in these institutions were segregated from their fellows, other precautions being taken to limit the infection, and all the open air consistent with the condition of the inmates being given to those infected. Whereas ten years ago tuberculosis was the great source of mortality in our insane asylums, prisons, and reformatories, it is now so well controlled that it plays a much less conspicuous rôle. The same, however, cannot be said of all our county almshouses and jails, and to these we must give special attention in the near future.

The dreadful conditions existing but a few years ago in the Bayview Hospital and Insane Asylum have been perceptibly bettered, and now, in the quarters improvised by an ingenious Board of Management, patients from the asylum with tuberculosis may be seen taking the full open-air treatment with wonderful success, considering their mental and physical conditions, and in the almshouse a meritorious attempt is being made to segregate the consumptives and give them the advantage of good food, rest, and open air. Upon the hill adjacent to Bayview there has been erected a ward for the tuberculous poor of both sexes and colors, and, with money for its improvement upon somewhat more approved lines of construction, a most useful nucleus of a municipal hospital for the care of advanced cases of consumption is already at hand.

The laws of Maryland, so far as relates to the State dealing with the tuberculosis problem are eminently satisfactory. We have that most efficient of all laws, which classifies tuberculosis among the infectious diseases and requires all physicians to send notice to the State Board of Health of each new patient seen with tuberculosis in one of its dangerous forms. If this law is obeyed, it makes it possible for the State Board of Health to know the locality of every case of consumption in the State without inflicting any hardship whatever upon any individual, inasmuch as the records are absolutely secret,

and no one outside of the board can possibly learn the names or localities of those reported. But it gives to the board a control over the situation which it can use to the welfare of the whole community. Coupled with this law and supplementing it is another of equal importance, making it possible for the boards of health to do the best kind of preventive and relief work in cases where the attending physician does not care to undertake the task.

This law directs the local boards of health to furnish antiseptics, paper napkins, spit cups, and necessary information to all consumptives unless the physician in attendance supplies these articles. It is hard to see how wiser provisions could have been made, and the good which results to many poor families, ignorant and unable to provide for themselves, is immeasurable. No State in the Union has a better law than this to enable the authorities to control and diminish tuberculosis.

Moreover, we have, too, a State laboratory established by law where the sputum from any patient in the State may be examined free, for the presence or absence of the germs of tuberculosis. This law enables the poorest patient in the State to have the advantage of the latest laboratory methods in the diagnosis of his case. No better opportunities through private laboratories can be given to the very richest. And still another law of which we boast is that forbidding spitting either on the sidewalks or in public conveyances or public places. When we recall that dried sputum is probably one of the principal sources of danger in transmitting tuberculosis from one person to another, the importance of this law cannot be overestimated.

Following these wise provisions, the last legislature took the next logical step in the crusade; namely, to appropriate money for the erection of a State sanatorium.

It is the hope of the board of managers of this sanatorium for *early* cases, those in which the chances of complete recovery are excellent, that it will be ready to receive patients by December of this year. A beautiful tract of land has been secured in the Blue Ridge Mountains at an altitude of 1500 feet, and already the plans for the buildings are well advanced. In the beginning its capacity will be small, and the utmost care must be exercised in selecting suitable cases for treatment, for it can well be seen that if but 64 beds are at first available, the utmost caution must be exercised to fill them with the patients likely to receive the greatest amount of good. It is a sad fact, and one needing especial emphasis, that of the patients applying for admittance to the sanatoria already in existence, scarcely more than one-third are in the early or incipient stage from which there is any great likelihood of recovery; it strikes one, therefore, with redoubled force, that somewhere grave mistakes are being made. When *our* State sanatorium is in operation I hope it will not have to report, as those of New York and Massachusetts have just reported, that only 40 per cent of its beds are occupied by the kind of patients for whom these institutions were built.

May I not appeal to the medical profession of Maryland to consider the gravity of delay in making a diagnosis of tuberculosis—and may I not appeal to all who find themselves run down with cough, fever, or malaise, that they hasten to learn the true nature of their disease; not to content themselves with having it called "a touch of bronchitis" or some other trifling malady, but rather to make sure, as did a patient at the Mt. Airy Camp, who, feeling that his physician had erred, himself sent his own sputum to the State laboratory only to learn in truth that he had tuberculosis. Fortunate for him, his distrust and his energy, for after six months open-air life at the Mt. Airy Camp, he was able to return home, and now, nearly two years later, is perfectly well and at work. If the life of a young, active man is estimated to be worth $2500, as is determined by the insurance companies, then the life of this one patient more than paid for all the expenditures of construction at Mt. Airy, an expenditure which was so generously made by the Quarter Club of Young Ladies of Baltimore.

In most of the large, and in many of the smaller, communities of the world, associations or their counterparts have been formed for conducting a campaign of education as to the nature of tuberculosis, how it can be prevented and how it can be cured. In this particular also Maryland has undertaken her responsibility. Inaugurated by the Tuberculosis Commission, of which Professor Wm. S. Thayer has been the efficient head, we have a very strong and active association with headquarters in Baltimore and with auxiliary associations in at least three counties of the State. The membership of the association is wholly unrestricted and should include every public-spirited man and woman of the State. For three years this association, by means of literature, lectures, reports, meetings, etc., has been spreading the knowledge of the infectiousness of tuberculosis and how it may be avoided; moreover, it has interested itself in observing the execution of the State and municipal laws and has proved of assistance to the Board of Health in moulding public opinion to an acceptance of these laws, particularly that most beneficial one, the disinfection of all houses after the death or removal of a case of "open" tuberculosis. While there is in some quarters a feeling that this law is prone to excite a false sense of security, there can be no doubt of its value if faithfully executed. The germs of consumption lurking in the dark corners of rooms occupied by consumptives are so likely to transmit the disease to the next occupant that tuberculosis is often spoken of as a house disease—one member after another of the same family becoming infected in this way and new occupants having the disease handed on to them unless the most thorough disinfection is practised.

In all this work we are fortunate in having State and city boards of health interested and energetic in carrying out to the fullest their part in the fight. The city board is paying especial attention to fumigation, while the State board is ever mindful of the problem in its widest aspects. Perhaps to no single person does the community owe so much as to the secretary of the State Board of Health. He has been the one to suggest many beneficent laws and he has been most instrumental in their enforcement. His, too, was the idea of the

tuberculosis and milk exhibits, which did so much to show our people the prevalence of consumption and the inferior, if not dangerous, quality of our milk.

The allied associations, that for the Improvement of the Condition of the Poor and the Charity Organization Society, are powerful factors, too, in our midst in this warfare which is being waged. The amount of relief the former has given in the nature of a diet of milk and eggs to many a poor patient is only known to the agents of the society. The reports show that in the past few years thousands of dollars have been expended in this deserving way.

For the past year two trained nurses in addition to the one supported in connection with the Phipps Dispensary, have been giving their entire time to the poor consumptive patients in the city. One has been supported by funds raised by Mrs. William Osler, the other by contributions of the Nurses' Association of Maryland. No factor in the city is more instrumental for the good of our cause than these nurses. They not only aid the sufferers, but they assist and encourage the members of afflicted families and others to seek advice and avoid the disease. In this way many an early case has been brought to the attention of the dispensary physicians, and so at a time when they had a chance for cure they have been sent to the sanatorium. It is from this class of patients that we are now at Eudowood getting our first truly hopeful incipient cases.

But in the great fight against the evil in our midst, I conceive our greatest asset to be the enlightened and interested public opinion which exists nowhere to a greater extent than right here in our own resurrected Baltimore. We do not need to be told, as were the people of Great Brtain when the Prince of Wales returned from his Indian tour, "Wake up." We are already awake, and, moreover, we have ourselves clothed and armed, determined to make effective our ideas and our hopes, watchful that our police department enforces to the letter the ordinance against spitting, that our board of health disinfects and fumigates beyond a shadow of criticism every infected home, and that our physicians evade not the law in reporting all cases of "open" tuberculosis coming to their attention. A striking illustration of the awakening of the community is found in the recent magnificent gift of Mr. Epstein to the Associated Jewish Charities for a consumptive hospital and in the eagerness with which his colleagues are subscribing $500 annually for its support.

The value of the campaign just finished has been greater than the $10,000 collected, and were it to be buried out of sight forever, our community would have received the full worth of its money in the awakened interest it takes in combating this plague; but instead of being buried it is going to be put into the most effective channels for carrying out the purposes of its collection—channels in which not only will the fence of prevention be fostered and strengthened, but also the more philanthropic and humanitarian sides of the work be developed. We expect to put into the field three new nurses whose work shall be exclusively among the poor of the city afflicted with tuberculosis.

We mean to encourage the establishment in the more remote and thickly settled portions of the city, such as Southeast Baltimore, of dispensaries, which will serve such neighborhoods as do the Phipps and University of Maryland dispensaries in the quarters where they are situated. Moreover, we hope to form a permanent exhibit illustrating tuberculosis in all its phases, pathological and economical—its means of prevention and cure. This exhibit, with a competent person to illustrate its features, will be displayed in various parts of the State, visiting at least every county seat. By such a method as this, we are confident a much wider appreciation of the ravages of tuberculosis will be gained. The distribution of literature and the giving of talks in all parts of the city and State will continue, and a closer alliance with workingmen's leagues, mutual benefit societies, and trade-unions, and other such organizations, will be encouraged.

In general, this is the situation in Maryland to-day, but what then is the next step? It is this, we must provide for advanced cases. Massachusetts has recently had a commission to study the problem, and it has recommended that three hospitals for advanced cases be built in various parts of the State—each of a capacity of 150 beds. Here in Maryland no side of our work needs such important development. The tuberculosis nurses feel especially this necessity, for they are constantly meeting with poor sufferers too advanced to be sent to the sanatoria, and too poor to be able to provide for themselves necessary comforts at home; moreover, these patients are the greatest menace to their family and the community, many of them being too ignorant to appreciate their danger to others, many more too ill to care. By the action of the last legislature the State has shown it appreciates its responsibility in the tuberculosis movement, and we shall look to the next legislature not only to carry on what is now so well begun, but to take this next step forward for the welfare of the whole people. In a measure each separate community should make provision for its own advanced patients, who are often too ill to be taken far from home, but need rather to be cared for in some nearby spot easily accessible to friends and relatives.

Hospitals receiving State aid may well determine to set aside a number of beds for such cases as these. Private charity cannot undertake this work to any great extent, but private philanthropy should be appealed to to the extent of its ability. We have in contemplation at Eudowood a hospital for 40 or 50 advanced cases, but this will do but little toward accommodating the many patients of this class in Baltimore alone, whereas if the State and the State-aided hospitals will give attention to this important side of the work, the conditions can soon be materially improved.

The low mortality from consumption in London is ascribed by many to the fact that for many years that city has been caring for its advanced cases. No state and no community can any longer consider that they have done their full duty in this crusade until they have provided amply for these distressing cases which furnish the great supply of infectious material for the continuance of the plague.

And what is the second step? It is to limit the supply of this infectious material which comes to us daily in our milk.

We must have more thorough State or municipal inspection of this product. Gradually the idea is spreading, whether it be wholly true or not, that the number of people, especially children, who take the disease from milk from tuberculous cows is large. There are opponents to this theory, but we cannot afford to run risks. Examination shows that the dairy cows of all states are very seriously infected and the milk of such cows, whether the udder itself be diseased or not, may contain tubercle bacilli. In one dairy herd in Rhode Island tested with tuberculin by The Newport Association for the Prevention of Tuberculosis 27 out of 39 cows, I think I have the figures right, showed themselves tuberculous, and every cow proved at autopsy that the test had told the truth. Is it not probable that we here in Maryland are using milk from herds of cows as seriously diseased? The thought alone is most repulsive, but the danger is most grave. Individuals cannot differentiate the contaminated from the pure milk, and so it is the urgent duty of both city and State to take the necessary precautions to protect their people. A law should be passed at the next legislature that no milk coming from dairies where all the cows have not been proven free of tuberculosis by the tuberculin test shall be publicly or privately sold. This would mean the slaughter of many cows, and in the loss to the farmer and dairy-man the State should be willing to bear a part of the expense for the sake of the safety of its citizens. With a pure milk supply and the meat of animals so carefully inspected that tuberculous flesh is not sold, a great advance will have been made.

Until within a few years the disease was not, in the minds either of the doctors or of the laity, commonly associated with children. We thought of them as having other forms of tuberculosis, especially the so-called surgical tuberculosis of bones, glands, etc., but not of the lungs. How children not living in immediate association with tuberculous families or individuals catch tuberculosis has been, and is, a subject of much careful study; if from cow's milk, then better there were no milk if it cannot be pure; but it can be pure and clean; it is only a question of healthy cows and clean handling, and both ends are easily attainable. Miss La Motte, one of the district tuberculosis nurses of this city, reports 29 children with consumption in her district. Children in the early stages of tuberculosis are prone to recovery, but what are we doing here in Maryland for these children? A few private associations are giving summer outings to a limited number, that is all. France, which leads the world in this respect, as in so many others, already has between 6000 and 7000 sanatorium beds for children with tuberculosis,—sanatoria at the seashore, especially for the surgical cases, and sanatoria in the country for consumptives.

But there is another side of the problem which claims attention. We may diminish the number of germs, we may care for the hopelessly ill, we may cure the early afflicted, but we must also take such care of the *well* that they may resist the attacks of the hidden foe. This can be done only by insisting upon the employment of all the factors which contribute to a perfectly sound body. Sanitation in all its forms: maximum of sunshine and air in all our dwellings, workshops, and schools; wider, better-paved, and cleaner streets; more parks and playgrounds; pure water supply and good drainage; better housing conditions; more food and that better cooked. All such factors as summer homes for children, playground associations, garden cities, and many other associations occupied with bettering conditions, are aiding the work, but it seems to me we must look to the schools for our progress in the near future. The boys and girls of to-day are the men and women of a few years hence. If as children they learn the lesson thoroughly they will be able to practise it when grown. I believe no question is so important as to teach the children how to avoid tuberculosis—is there anything more weighty for them to know? Do not reading, writing, and arithmetic sink into insignificance in comparison with the knowledge of how to live so as to live? What may be the best method for teaching this knowledge I am not prepared to say; the text-books upon physiology now in our schools are excellent, but they do not go far enough, they do not lay sufficient stress on the problem of how to live healthy. There must be a personal note put into this teaching, one that will strike home into every child's thoughts, one that will find such a lodgment there that habits of health will become automatic, as are so many other facts of education learned in childhood. Some form of objective teaching might be introduced successfully; for example, permanent tuberculosis exhibits simple in character, illustrating the value of cleanliness, exercise, and open air; this surely would be worth trying. Our schoolhouses should be, more than they are, centers of knowledge where parents as well as pupils could be taught the many lessons they should know. There is still one other class of school children and young people who should be more carefully looked after than they are. In France again they are ahead of us in this matter. I refer to those who may be styled the pre-tuberculous, *i. e.*, those who from one cause or another have become so run down, pale, weak, and debilitated that they are likely to become tuberculous. If taken in time these can be saved—a few months in the open air will do it. In Germany and in France they have established schools in the country or parks for the pupils of this class. In this way every year a large number are prevented from getting tuberculosis by increasing at a critical moment the powers of resistance. This is something we might do here.

But there seems no end to what we can and ought to do. Day camps for those who cannot leave home at night—night camps for sleeping out-of-doors for those who must work in the day-time and have no means of sleeping out at night—much more interest on the part of employers of labor in their employees—letters like the following, which was written by a large manufacturing shoe house to all its hands:

OXFORD, MASS., March 1, 1906.

During the year 1905 no death from consumption is known to have occurred among the employees and their families of the factory. It is hoped that this good record will continue. To that end your attention is called to the following facts concerning consumption, and in particular to the occurrence of consumption in Oxford.

Consumption is a contagious disease. It is transmitted almost entirely by the sputum which is coughed up. This dries, and the dried particles containing the germs then float about in the air or are deposited upon neighboring objects. If these get into the body, consumption may result. The destruction of the sputum prevents the spread of the disease, and does it so surely that in consumptive hospitals nurses almost never take it.

Consumption has caused more than one death out of six in Oxford during the last sixty years. In the last thirty-five years it has greatly decreased, and at present only one-third as many people die of it as thirty-five years ago. In the last five years the decrease was as great as in the preceding ten years, and there is a good prospect that it can be stamped out, if all realize how it spreads. There were but four deaths from consumption in Oxford in 1905.

There are about 600 houses in Oxford, and in over one-third of this number some one had died of consumption. As a rule, one death has been followed by another. This would not have taken place if all the sputum had been burned. If the rooms in which a person with consumption has lived are thoroughly cleaned and aired, and opened to the sunlight, there is little danger that anyone will then get the disease from living in them.

Consumption spreads in families only because the members live together, and so infect one another. Living together is more important than relationship. In the sixty years, 1844-1904, 512 deaths from consumption in Oxford occurred in as many as 403 different families. One of these was as follows: A mother and three daughters died of consumption within three years of each other, in the same house; the father then moved away, but fell a victim to the disease a year later. Compare the above family with this typical instance of "farm-house consumption" in Oxford: A young man of twenty-one died in 1879 on a farm; seven years later his sister died in the same house; their mother died after another interval of eight years, also in the same house; and a year later another of her sons; three years later still another brother similarly succumbed, but in a different dwelling.

Consumption can be avoided. To do this, help all who have the disease to keep their houses clean, and show them how to destroy their sputum; then they will not give you the disease. Encourage everyone to open his windows, let in the sunlight, and stay out of doors whenever he can.

If you have a cough, see the doctor, and have your sputum examined for germs of the disease. One examination is not enough. The State Board of Health will examine sputum for nothing.

The firm hopes that it will be notified of any case of consumption occurring among the employees or their families. If anyone now in the employ of the A. L. Joslin Company has the disease, or contracts it, and secures the admission this year to the State Sanatorium at Rutland, the firm will offer to pay his or her board there for three months.

A. L. Joslin Company.

Nor can we neglect the colored population of the State either upon philanthropic or on economical grounds. They are particularly susceptible to infection, and their habits and manner of life make them a source of danger in the community. They are working in almost every house and whatever is for their welfare is for the welfare of all. We need institutions where the early cases may be treated, but more especially we need hospitals where the more advanced cases may be segregated. We cannot hope to stamp out tuberculosis from Maryland until we have provided for the colored race as well as the white. It may take some years, but just as smallpox was overcome in the early years of the last century, so I believe it possible that tuberculosis may be in this. God grant this may not be a futile hope.

INTESTINAL OBSTRUCTION.[1]

By Joseph C. Bloodgood, M. D.

Stimulated, probably, by some interesting recent cases, I felt that a careful clinical and pathological investigation of the experience of Dr. Halsted's clinic of the Johns Hopkins Hospital, of intestinal obstruction, would at least be valuable to myself. It proved to be of such interest that I presented some of the conclusions before the New York State Medical Society, in Albany, January 30, and do not hesitate to repeat them again to-night.

The conclusions in regard to the importance of early intervention in all cases and the life-saving measure of enterostomy in late cases, I find is confirmed by Rubritius (Beiträge zur klin. Chir., 1906, vol. lii, p. 405) from Wölfler's clinic in Prague, by Simon (Beiträge zur klin. Chir., 1905, vol. xlv, p. 489) from Czerny's clinic in Heidelberg, and by Göbell (Deutsche Zeitschr. f. Chir., 1906, vol. lxxxii, p. 416) from Helferich's clinic in Kiel.

"Intestinal obstruction" should be employed as a general term and corresponds to the German term "ileus." All authorities recognize two groups—*strangulation ileus,* in which, in addition to obstruction to the lumen of the intestine, there is interference with the mesenteric blood supply; and *obturation ileus,* in which the blood supply of the obstructed portion of the intestine is not disturbed. In some cases the intestinal obstruction may begin as an obturation and end as a strangulation.

It is quite true that in obturation ileus the patients may survive a longer period from the onset of the symptoms to the time of operative relief. Nevertheless, in either group immediate surgical relief gives the best results.

The older view favoring delay in obturation ileus is emphatically discredited by all recent contributions. Intestinal obstruction from its onset should be looked upon as a surgical lesion, and no conservative means should be employed for its relief, except the washing out of the stomach and high rectal enemata. These should be used only in the early hours; and if relief is not immediate, the abdomen should be opened. Any food, liquid or solid, or cathartics by mouth, is absolutely contra-indicated, from the moment of the first symptom until the patient is relieved. Morphia should not be given for the pain unless operation has been decided upon.

[1] Paper read before the Medical and Chirurgical Faculty of Baltimore.

These rules, simple as they may appear, have seldom, if ever, been followed with patients admitted to surgical wards. In the three contributions from the German clinics just mentioned, and in many other articles on special forms of ileus, the writers call attention to the delay after which these patients are referred to the surgeon, to their previous drastic treatment with cathartics, and to the masking of the symptoms with large doses of opium.

I found the same to be true in a series of cases admitted to the surgical clinic of the Johns Hopkins Hospital.

Intestinal obstruction is a relatively infrequent disease. Among about 20,000 patients admitted to the surgical clinic I find but 103 instances of ileus, and rarely have two of these cases come from the practice of the same physician.

The general practitioner, therefore, will be called upon to attend this lesion only at rare intervals. It should be the duty of surgical clinics, whose collective experience is so much larger, to instruct the physician on the symptoms of onset, and to demonstrate to him by irrefutable figures that their patients' chances are tremendously increased by operative interference, if possible within the first 24 hours, at least before the end of the second day. The more acute the symptoms of onset the more immediate must be relief. It is fortunate that in strangulation ileus, in which the earliest intervention is required, the symptoms of onset are most acute and characteristic, while in oburation ileus the clinical picture is most obscure, requiring sometimes a few days to make the diagnosis. Fortunately, if the delay of relief is not too long, the chances of recovery are good.

Surgeons are in a better position than physicians to study the early clinical picture of intestinal obstruction. After every laparotomy this complication must be borne in mind. All post-operative patients receive unusually critical investigation, if any symptoms suggestive of obstruction arise. That surgeons have become more expert in the diagnosis is borne out by the fact that in Dr. Halsted's clinic, and in observations of my own in other hospitals, post-operative intestinal obstruction has been recognized early, and the mortality is strikingly less than in the group of patients first observed outside the clinic and then referred for operative treatment. It is due, then, to this fact that one feels justified in speaking so emphatically to the general practitioner.

In strangulation ileus there are two factors which give rise to symptoms—obstruction to the flow of intestinal contents, and interference with the circulation of the obstructed intestine. It is the interference with the blood supply that gives the acute symptoms of onset in strangulation ileus: the intense pain, the peritoneal shock, and the primary reflex vomiting. Secondary vomiting, fecal in character, and distention are symptoms due to the obstruction and may be looked upon as late symptoms—symptoms which one should not wait for in order to make a diagnosis. In obturation ileus the symptoms of onset present in strangulation are usually absent. The patient may complain of some abdominal pain, which is described more as a general discomfort than as acute agony. It is constipation that first attracts his attention, then distention, then vomiting, which may, in delayed cases, be fecal in character.

It is frequently difficult to explain the exact cause of pain and its acuteness in a strangulation ileus. We know that the intestine is insensitive. One interested in the sensitiveness of the peritoneum and abdominal viscera and the explanation of intestinal colic, should read Lennander's (Mittheilungen aus d. Grenzgeb. d. Chir. u. Med., 1906, vol. xvi, pp. 19 and 24) and Wilms' (Ibid., 1906, vol. xvi, p. 609) recent communications. There is no question as to the pain in strangulation ileus, and apparently it is not due, in its onset, to increased peristalsis. It is probably explained by the pull on the mesentery or the interference with its blood supply which affect the sensitive nerves at the mesenteric base. For example, I have seen a number of instances of strangulated inguinal or femoral herniæ of the Ritter variety. Here the wall only of the gut is caught. These patients complain very much less of pain than those in whom the mesentery participates in the strangulation. The pain in strangulation ileus is not always localized in the position of the strangulated gut, but is referred to some other part of the abdomen. In two recent cases of acute volvulus of the sigmoid colon under my own observation, the pain was referred to the region of the left kidney, which corresponds to the origin of the nerves supplying the mesosigmoid. When peristalsis takes place, either in strangulation or in obturation ileus, the pain becomes intermittent or colicky in character. The cause of this pain of intestinal colic has not been satisfactorily explained. The most characteristic symptom, then, of strangulation ileus is the sudden, intense abdominal pain. If situated in the right iliac fossa it may suggest appendicitis; in the gall-bladder area—gall-stone colic; if in the region of the kidney—renal colic. In my two cases of acute volvulus of the sigmoid the pain alone could not have been differentiated from that due to a stone in the kidney; in one it was referred to the testicle. A patient, therefore, who complains of sudden abdominal pain of such intensity that he begs for relief should be examined most critically, and the possibility of an acute lesion demanding early operative relief should be considered. In the pain from strangulation ileus the shock is more marked than that observed in those cases associated with appendicitis, gall-stones, or renal calculus. As a rule the shock is not so severe as that seen in acute hemorrhagic pancreatitis.

In the two cases of acute volvulus above referred to the immediate and quite distinct shock following the pain was of great value in excluding renal calculus. The primary nausea and vomiting are undoubtedly reflex in character. These symptoms are not at all characteristic of obstruction, and may be present in any acute abdominal lesion.

If the patient complaining of severe abdominal pain, nausea, and vomiting, is examined, one will find some symptoms of shock—the pulse is rapid, the face is pale, and the patient will state that he feels distinctly weak, as if he has been kicked in the abdomen, while the moment before the attack of pain he may have been in the best of health and strength. If the abdomen is now carefully examined, one does not find the localized

tenderness and muscle spasm, early signs in appendicitis and cholecystitis, but a more general muscle rigidity without tenderness; now and then the distended loop above the strangulation can be palpated (von Wahl's sign). If this is situated in the pelvis it is felt per vaginam or rectum. The palpation of the distended loop may be looked upon as the pathognomonic symptom of strangulation ileus, but it can be distinguished only in the early hours before general distention obliterates it. In the recent case of acute volvulus of the sigmoid seen six hours after the onset the only symptoms were: pain in the region of the kidney, nausea, and slight shock, which had been more marked in the first two hours. Although all the abdominal muscles were held rigid, the patient complained absolutely of no tenderness. The muscles on the left side were more rigid than those on the right. Yet there was absolutely no tenderness over the sigmoid. After a very careful palpation, I could make out, I thought, a distended loop.

The next sign in strangulation ileus to which Schlange first called attention in 1895 is peristalsis. There is no doubt as to the interpretation of this symptom if it can be demonstrated.

How often peristalsis can be made out in strangulation ileus is impossible to state. It has been present and recorded in a certain number of cases early in the attack. The older view that peristalsis did not take place when the gut was strangulated has therefore been refuted. I have observed it early in post-operative obstruction, when the small intestine was involved, I have seen it in intussusception of the ileo-cecal type, and it was present in a few cases of strangulation by bands which I had the good fortune to observe within the first 24 hours. It is always absent in the late cases of the strangulation type, that is, when the small intestines are distended and to a certain degree paralyzed. One, therefore, should not wait for peristalsis, nor consider its absence as excluding obstruction.

In my own experience which I have referred to in 1901 (Transactions of the American Surgical Association, vol. xix, p. 139) a leucocytosis is a very important aid in the early recognition of intestinal strangulation. I think my colleague, Dr. Harvey Cushing, was the first to call attention to this fact in Dr. Halsted's clinic in 1898. I mentioned this in a report on hernia (Johns Hopkins Hospital Reports, vol. vii, p. 332). Since then all the surgeons connected with this clinic have made blood-counts in cases of suspected strangulation, primary or post-operative, and have confirmed the early experience. The cases of acute volvulus which I have mentioned here a number of times had a leucocyte count of 34,000 three hours after the onset. I have to thank Dr. Shaw of St. Agnes Hospital for this early observation.

Complete constipation is always present, but if the patient has not had a stool for a day or two before the onset of the acute attack, the first enema may bring away fecal contents; but this gives no relief, and after this repeated enemata are ineffectual.

In strangulation ileus, to summarize, the patient complains of acute abdominal pain, sudden in onset, with no previous premonitory symptoms—the first attack, as a rule. Reflex nausea and vomiting, and peritoneal shock rapidly follow. If it is some hours after a meal the vomitus contains nothing but the normal contents of the stomach, or if shortly after a meal, partially digested food. Now and then the sudden pain comes so quickly after a large meal or indiscretions in diet or liquid that the patient attributes his pain to this fact. The pain continues, and if the patient is seen early, one will find symptoms of shock. An enema, whether effectual or not, gives no relief. If the patient has vomited a stomach washing is negative. The abdominal muscles are held somewhat rigid, and the rigidity is most marked in the region of pain. There is no abdominal tenderness. Examined carefully, von Wahl's loop or peristalsis may be made out. The blood-count will show a leucocytosis. If one or all of the three latter symptoms are present the diagnosis can be made. If the three latter symptoms are absent such a patient should receive nothing by mouth, the only treatment should consist of high enemata. If these are ineffectual and the symptoms persist surgical consultation is indicated. I believe a careful examination in the early hours will demonstrate the characteristic signs—the palpable loop, the peristalsis, or the leucocytosis. This, with the initial symptoms and the continuing absence of feces or gas per anum, is sufficient to indicate immediate operation. In post-operative cases surgeons do not delay, but at the present time unfortunately few patients are admitted to the surgical clinic in this early stage. The later symptoms are: fecal vomiting, general abdominal distention, continuing absolute constipation, and the signs of autointoxication. Now the diagnosis is simple, but the chances of recovery, even though the operation be performed early in this stage, are few.

In obturation ileus the acute primary symptoms are frequently absent. There is often a previous history of constipation and abdominal colic. In carcinoma of the large intestine there may be a history of blood in the stool, or intermittent diarrhœa and constipation. In this group of obturation ileus, I have been impressed with the history of recurrent attacks of intestinal obstruction,—that is, absolute constipation, vomiting (not fecal), and distention,—which have been relieved after a day or two by cathartics and enemata. This history of a successful non-operative relief often puts the physician off his guard and operative interference is delayed. In one of my own cases there was a history of five such attacks, one lasting five days. In obturation from carcinoma of the large intestine the obstruction of the lumen may not be absolutely complete, and some little fecal matter and gas may pass, appear in the enema, and if this symptom is interpreted as a sign of relief the necessary operation is often further delayed. When the obturation is in the small intestine, peristalsis is a constant early symptom. If the obstruction is high in the small intestine distention is slight or absent and vomiting of a fecal character early. In obturation the symptoms are more obscure than in strangulation ileus, but the constipation, even though there be no vomiting or peristalsis, should be regarded as suspicious; the following distention, even without vomiting, as still more suspicious. In obturation of the colon the

distention may be extreme before vomiting takes place. This clinical picture with the evidence of some gas and feces in the enema should be enough to allow a diagnosis of an obstruction of the large intestine. Early vomiting and absolute constipation, sometimes without much pain and with little or no distention, indicate an obturation of the small intestine high up; peristalsis can usually be made out.

I have not mentioned movable dullness in the abdomen. It is practically absent in obturation ileus, and is a late sign in strangulated ileus.

From my own experience in post-operative obstruction, and from the few cases that I have seen in the early hours of primary intestinal obstruction, I believe that it is not difficult to make a diagnosis at a period in which operative intervention promises an excellent chance of recovery. If the practitioners will avoid giving cathartics indiscriminately, place such patients in bed, give them nothing by mouth, employ the stomach tube and rectal enemata early, make a careful abdominal examination and blood-count, and avoid morphia if possible, I feel quite confident that they will be able to recognize intestinal obstruction in the early hours. If the intense agony demands some relief before a decision as to operative intervention can be made, small doses of morphia may be given. This has been accomplished in appendicitis, and in perforated gastric and duodenal ulcer; why not in intestinal obstruction?

The problems in the surgery of intestinal obstruction present increasing difficulties with the duration of the attack and the possible complications. In strangulation ileus peritonitis may take place without gangrene or perforation; autointoxication must be considered in all late cases.

Before operation the stomach should be washed out. Chloroform may be the best anesthetic. The anesthesia must be very carefully induced. The washing out of the stomach does not always prevent vomiting under narcosis, and in such cases chloroform is better than ether. The selection of the position of the incision varies. If the exact position of the obstruction cannot be fixed, median laparotomy should be performed. In desperate cases a simple enterostomy under cocaine may have to be done. This is only feasible in obstruction of the large intestine, or low down in the ileum. If possible, the obstruction should be found and relieved. If the intestine above the point of obstruction is distended and filled with fluid contents, it should be evacuated; and if the symptoms have been present over 48 hours, enterostomy should be performed in addition to the relief of the obstruction. The mortality of operation after 48 hours without enterostomy is so definitely higher than with enterstomy, that there appears at this time no question as to the efficacy of this additional safeguard. The object of the enterostomy is to aid the patient in immediately disposing of intestinal contents and combating autointoxication. When the intestine is the seat of gangrene, the gangrenous loop must be taken out of the abdominal cavity. The surgeon has to decide between fixing the loop outside of the wound with enterostomy above, and later resection, or resection at once with fixation of the ends in the wound, and resection with suture. This decision is reached in individual cases. When there is obturation from a new growth, one must decide between enterostomy or colostomy alone with a later operation for resection, and immediate resection. The earlier the operation takes place after the initial symptoms the easier to settle these questions, and the more frequently can the lesion of the intestine be relieved completely at one operation with the least mortality.

THE PURPLE ISLAND BY PHENIAS FLETCHER.

A SEVENTEENTH CENTURY LAYMAN'S POETICAL CONCEPTION OF THE HUMAN BODY.

By AUGUSTUS GROTE POHLMAN, M. D.

Associate Professor of Anatomy, Indiana University.

The Purple Island by Phenias Fletcher (1582-1650) was first published in 1633; again in 1784; a third time in 1816, and the last edition (at hand and limited to 106 copies) in 1869. While authorities seem to believe that Fletcher's poetry influenced that of the immortal Milton, they appear to regard his work as stilted. The Purple Island, according to S. L. Lee, in the Dictionary of National Biography, is an allegory "overloaded with detail, and as a whole is clumsy and intricate." Nevertheless the poem is to be looked upon with interest in that the first five cantos contain a dissertation on the human body in verse, and in that they furnish us with an idea of how well a layman understood the structure of self at that time. The Purple Island is not an accessible book, and for that reason I offer some of the better verses, illustrating particularly apt descriptions, together with a meager account of the scope of the work.

"Thirsil" (Fletcher himself) sings of the wonders of the body to the "nymphs and shepherd-boyes." The creation is naturally Genesis:

> "Nor made He this like other Isles; but gave it
> Vigour, sence, reason, and a perfect motion,
> To move it self whither it self would have it,
> And know what falls within the verge of notion:
> No time might change it, but as ages went,
> So still return'd; still spending never spent;
> More rising in their fall, more rich in detriment."—I, 46.

> "Looke as a scholar, who doth closely gather
> Many large volumes in a narrow space;
> So that great Wisdome all this All together
> Confin'd into this Island's little space;
> And being one, soon into two he fram'd it;
> And now made two, to one again reclaim'd it;
> The little Isle of Man, or Purple Island nam'd it."—I, 48.

In Canto II the description of the body begins with bone, cartilage, and ligament.

"It grounded lies upon a sure foundation,
Compact, and hard; whose matter—cold and drie—
To marble turns in strongest congelation;
Fram'd of fat earth, which fires together tie:
Through all the Isle, and every part extent,
To give just form to every regiment;
Imparting to each part due strength and stablishment."
—II, 5.

"Whose looser ends are glu'd with brother earth,
Of nature like, and of a near relation;
Of self-same parents both, at self-same birth;
That oft it self stands for a good foundation:
Both these a third doth soulder fast, and binde;
Softer than both, yet of the self-same kinde;
All instruments of motion when combin'd."—II, 6.

He goes on to mention the muscle mass and coverings of the body, but takes these up in greater detail later. The first allusion to the circulatory system is as follows:

"Nor is there any part in all this land,
But is a little Isle: for thousand brooks
In azure chanels glide on silver sand;
Their serpent windings and deceiving crooks
Circling about, and wat'ring all the plain,
Emptie themselves into th' all-drinking main;
And creeping forward slide, but never turn again."—II, 9.

It might be inferred that Fletcher knew of Harvey's work published five years before the printing of the Purple Island. Further reading shows that this is not the case, and also is substantiated in the prelude: "I am entring upon my Winter, and yet these blooms of my first Spring." It is thought that Fletcher started the work while at Cambidge where he entered in 1600.

The Island is parted in three regiments, "By three Metropolies joyntly sway'd," namely, the abdomen, chest, and head—with liver, heart, and brain as "chief cities," respectively. He describes the five layers of the abdominal wall:

"The first of these is that round spreading fence,
Which like a sea girts th' Isle in every part;
Of fairest building, quick and nimble sence,
Of common matter fram'd with speciall art;
Of middle temper, outwardest of all,
To warn of every chance that may befall:
The same a fence and spie; a watchman, and a wall."
—II, 16.

"It cover'd stands with silken flourishing,
Which as it oft decales, renews again,
The other's sense and beautie perfecting;
Which els would feel, but with unusuall pain:
Whose pleasing sweetnesse and resplendent shine,
Softning the wanton touch, and wandring ey'n,
Doth oft the Prince himself with witch'ries undermine."
—II, 18.

It was not until Malpighi's time (1665) that the microscope made matters a little clearer.

"The second rampier of a softer matter,
Cast up by th' purple rivers' overflowing:
Whose airy wave, and swelling waters, fatter
For want of heat congeal'd, and thicker growing,
The wandering heat—which quiet ne're subsisteth—
Sends back again to what confine it listeth;
And outward enemies by yeelding most resisteth."—II, 19.

Even Malpighi seems to have been influenced by the popular notion as to the origin of fat when he saw minute globules floating in the blood stream and apparently leading from one fat mass in the omentum to another.

"The third more inward, firmer than the best,
May seem at first but thinly built, and slight;
But yet of more defence than all the rest;
Of thick and stubborn substance, strongly dight.
These three—three common sences—round impile
This regiment, and all the other Isle;
And saving inward friends, their outward foes beguile."
—II, 20.

"Beside these three, two more appropriate guards
With constant watch compasse this government:
The first eight companies in severall wards,
—To each his station in this regiment—
On each side foure, continuall watch observe,
And under one great Captain joyntly serve;
Two fore-right stand, two crosse, and foure obliquely swerve."—II, 21.

The verse on the peritoneum is accompanied by an interesting footnote which reads: "It hath many holes, that veins, arteries, and other needfull vessels might have passage both in and out." If by "other needfull vessels" Fletcher meant the lacteals discovered by Aselli in 1622, but not published until 1627 does not appear. It is probable that he meant the nerves.

"Between this sence's double-walled sides,
Four slender brooks run creeping o're the lea;
The first is call'd the Nurse, and rising slides
From this low region's Metropolie:
Two from the Heart-citie bend their silent pace;
The last from Urine-lake with waters base
In th' Allantoid sea empties his flowing race."—II, 23.

In his note on this verse he makes the following comment: "Where the vessels of the navile are contained. These are foure: first, the nurse; which is a vein nourishing the infant in the wombe; second, two arteries, in which the infant breathes; the fourth, the Ourachus, a pipe whereby (while the childe is in the wombe), the urine is carried into the Allantoid, or rather Amnion; which is a membrane receiving the sweat and urine." (Excellent knowledge for a clergyman.)

Six cities are found in this region: "The liver, stomack, with the guts; the gall, the spleene, or milt; the kidneys, and parts for generation.

Mastication and swallowing are mentioned. He believes in a definite sphincter—"the upper mouth of the stomack has little veins, or strings circular, to shut in the meat, and keep it from returning." The "Vas breve" is supposed to stir up "civile strife" and the spleen to be the seat of melancholy.

"The Island's common cook, Concoction" prepares the

food in the stomach by the aid of "moistning flames" sent it by neighboring organs. The "Porter" drains the kitchen, and he goes on to describe the intestines.

"These pipes are seven-fold longer than the Isle,
Yet all are folded in a little pile,
Whereof three noble are, and thinne; three thick and vile."
—II, 39.

"The first is narrow'st, and downright doth look,
Lest that his charge discharg'd might back retire;
And by the way takes in a bitter brook,
That when the chanel's stopt with stifeling mire,
Through th' idle pipe with pipe with piercing waters soking,
His tender sides with sharpest stream provoking,
Thrusts out the muddy parts, and rids the miry choking."
—II, 40.

"The foremost of the base half blinde appeares;
And where his broad way in an Isthmos ends,
There he examines all his passengers,
And those that ought not scape, he backward sends:
The second Æol's court, where tempests raging
Shut close within a cave the windes encaging;
With earthquakes shakes the Island, thunders saa presaging."—II, 42.[1]

The rectum and its sphincter are passed over hurriedly with the following words:

"This gate endow'd with many properties,
Yet for his office sight and naming flies;
Therefore between two hills in darkest valley lies."

The Epiploon, Mesenterium, and Pancreas are named. The function of the latter it will be remembered was not known at this time, and in fact it was regarded as more or less of a useless organ until Wirsung discovered the duct in 1643—some ten years after this book was published.

The description begins in Canto III with the Isle's great Steward—the liver: "To th' heart and to th' head-citie surely ti'd" as his note states to the heart by arteries, to the head by nerves (possibly the phrenics)—a connection between inflammation of the diaphragm and brain was mentioned by Galen, although stoutly denied by Alexander of Tralles, (see Puschmann's Alexander of Tralles, Vol. I, p. 510).

"Much like a mount, it easily ascendeth;
The upper part's all smooth as slipperie glasse:
But on the lower many a cragge dependeth;
Like to the hangings of some rockie masse:
Here first the purple fountain making vent,
By thousand rivers through the Isle dispent,
Gives every part fit growth and daily nourishment."—III, 7.

"Two purple streams here raise their boiling heads;
The first and least in th' hollow cavern breeding,
His waves on divers neighbor grounds dispreads:
The next fair river all the rest exceeding,
Topping the hill, breaks forth in fierce evasion,
And sheds abroad his Nile-like inundation;
So gives to all the Isle their food and vegetation."—III, 11.

"Yet these from other streams much different;
For others, as they longer, broader grow;
These as they runne in narrow banks impent,
Are then at least, when in the main they flow;
Much like a tree, which all his roots so guides,
That all the trunk in his full body hides;
Which straight his stemme to thousand branches subdivides."—III, 12.

"Yet lest these streams might hap to be infected
With other liquors in the well abounding;
Before their flowing chanels are detected,
Some lesser delfs, the fountain's bottome sounding,
Suck out the baser streams, the springs annoying,
An hundred pipes unto that end employing;
Thence run to fitter place, their noisome load convoying."
—III, 13.

He mentions the "controversie between the Peripateticks and the Physicians," and commits himself as follows:

"Such is fair Hepar, which with great dissension
Of all the rest pleads most antiquitie;
But yet th' Heart-citie with no less contention,
And justest challenge, claims prioritie:
But sure the Hepar was the elder bore;
For that small river, call'd the Nurse, of yore
Laid boths' foundation, yet Hepar built afore."—III, 14.

The three kinds of "excremental liquors"[2] were disposed of in verses 15, 16, and 17. It must of course be remembered that the work of Glisson and Malpighi did not appear until 1654 and 1661, and Malpighi had to contend with the idea that bile was formed in the gall bladder.

"Three pois'nous liquors from this purple well
Rise with the native streams, the first like fire,
All flaming hot, red, furious, and fell,
The spring of dire debate, and civile ire;
Which wer't not surely held with strong retention,
Would stirre domestick strife, and fierce contention,
And waste the weary Isle with never ceas'd dissension."

"Therefore close by a little conduit stands,
Choledochus, that drags this poison hence,
And safely locks it up in prison bands;
Thence gently drains it through a narrow fence;
A needfull fence attended with a guard,
That watches in the straits all closely barr'd,
Lest some might back escape and break the prison ward."

Fletcher comments on the last verse: "It hath two passages, one drawing the humour from the liver, another conveying the overplus to the first gut, and so emptying the gall. And this fence hath a double gate to keep the liquour from returning."

[1] "The first of the baser is called blinde: at whose end is an appendant, where if any of the thinner chyle do chance to escape, it is stopt, and by the veins of the midriffe suckt out."

[2] "The chyle, or juice of meats concocted in the stomack could not all be turned into sweet bloud by reason of the divers kinds of humours in it: Therefore there are three kinds of excrementall liquours suckt away by little vessels, and carried to their appointed places: one too light, and fiery; an other too earthy, and heavy; a third wheyish, and watery."

"The next ill stream the wholesome fount offending,
All dreary black and frightfull, hence convay'd
By divers drains unto the Splenion tending,
The Splenion o're against the Hepar laid,
Built long, and square: some say that Laughter here
Keeps residence, but Laughter sits not there,
Where darknesse ever dwells, and melancholy Fear."

"The third bad water, bubbling from this fountain,
Is wheyish cold, which with good liquours mient,
Is drawn into the double Nephros mountain;
Which suck the best for growth, and nourishment:
The worst, as through a little pap, distilling
To divers pipes, the pale cold humour swilling,
Runs down to th' Urine-lake, his banks thrice daily filling."

He foregoes a description of the genital organs under cloak of modesty:

"Forbear, my maiden song, to blazon wide
What th' Isle and Nature's self doth ever strive to hide."

Procreation, however, is aptly conveyed in verses 26 and 27.

"These two fair Isles distinct in their creation,
Yet one extracted from the other's side,
Are oft made one by Love's firm combination,
And from this unitie are multipli'd:
Strange may it seem; such their condition,
That they are more dispread by union;
And two are twenty made, by being made in one.

For from these two in Love's delight agreeing,
Another little Isle is soon proceeding;
At first of unlike frame and matter being;
In Venus' temple takes it form and breeding,
Till at full time the tedious prison flying,
It breaks all lets its ready way denying;
And shakes the trembling Isle with often painfull dying."

Canto IV deals with the middle province—the seat of "all heat and life" and "therefore walled about with ribs, for more safety."

"But in the front two fair twin-bulwarks rise,
In th' Arren built for strength, and ornament; [Arren the man]
In Thelu of more use, and larger size; [Thelu, the woman]
For hence the young Isle draws his nourishment:
Here lurking Cupid hides his bended bow;
Here milkie springs in sugred rivers flow;
Which first gave th' infant Isle to be, and then to grow."
—IV, 5.

"For when the lesser Island—still increasing
In Venus' temple—to some greatnesse swells,
Now larger rooms and bigger spaces seizing,
It stops the Hepar rivers; backward reels
The stream, and to these hills bears up his flight,
And in these founts—by some strange hidden might—
Dies his fair rosie waves into a lily white."—IV, 6.

A curious mistake, common even at the present time, is found in IV, 11.

"This third the merrie Diazome we call,
A border-citie these two coasts removing;
Which like a balk, with his crosse-builded wall,
Disparts the terms of anger, and of loving;
Keeps from th' Heart-citie fuming kitchen fires,
And to his neighbours gentle windes inspires;
Loose when he sucks in aire, contract when he expires."

The description of the heart is detailed. The Pericardium is mentioned as a "wheyish moat." The anatomy and physiology was derived for the most part from Galen and some from Vesalius, Columbus, and others. The coronary vessels are noted "two arteries, and a vein called the crowns." The heart is included in verses 18-24.

"The citie's self in two partitions reft,
That on the right, this on the other side:
The right—made tributarie to the left—
Brings in his pension at his certain tide,
A pension of liquours strangely wrought;
Which first by Hepar's streams are hither brought,
And here distill'd with art, beyond or words or thought.

The grosser waves of these life-streams—which here
With much, yet much lesse labour is prepar'd—
A doubtfull chanel down to Pneumon bear:
But to the left those labour'd extracts shar'd,
As through a wall, with hidden passage slide;
Where many secret gates—gates hardly spi'd—
With safe convoy give passage to the other side.

At each hand of the left two streets stand by,
Of severall stuffe, and severall working fram'd,
With hundred crooks, and deep-wrought cavitie:
Both like the ears in form, and so are nam'd.
I' th' right street the tribute liquour sitteth:
The left forc't aire into his concave getteth;
Which subtile wrought, and thinne, for future workmen fitteth.

The citie's left side,—by some hid direction—
Of this thinne aire, and of the right side's rent, [!]
—Compound together—makes a strange confection;
And in one vessel both together meynt, [mixed]
Stills them with equall never-quenched firing:
Then in small streams—through all the Island wiring—
Sends to every part, both heat and life inspiring.

In this Heart-citie foure main streams appeare,
One from the Hepar, where the tribute landeth,
Largely pours out his purple river here:
At whose wide mouth a band of Tritons standeth,
Three Tritons stand—who with their three-forkt mace
Drive on, and speed the river's flowing race,
But strongly stop the wave, if once it back repace.

The second is that doubtfull chanel, lending
Some of this tribute to the Pneumon nigh;
Whose springs by carefull guards are watcht, that sending
From thence the waters, all regresse denie:
The third unlike to this from Pneumon flowing,
And his due ayer-tribute here bestowing, [!]
Is kept by gates and barres, which stop all backward going.

The last full spring out of this left side rises,
Where three fair Nymphs, like Cynthia's self appearing,
Draw down the stream which all the Isle suffices;
But stop back-waies, some ill revoluture fearing.
This river still it self to lesse dividing,
At length with thousand little brooks runnes sliding,
His fellow course along with Hepar chanels guiding."

The function of the lungs was naturally restricted and not understood until the demonstration of the circulation by Harvey, even then imperfectly.

"Close by this pipe runnes that great chanel, down
Which from high Cephal's mount twice every day
Brings to Koilia due provision:
Straight at whose mouth a floud-gate stops the way,
Made like an ivie leaf, broad-angle-fashion;
Of matter hard, fitting his operation,
For swollowing soon to fall, and rise for inspiration."
—IV, 28.

The muscle tissue completing the tracheal rings dorsally had long been observed, but it was so arranged that "the meat pipe might not be galled or hurt."

"Fitly 'tis cloath'd with hangings thinne and light,
Lest too much weight might hinder motion:
His chiefest use to frame the voice aright;
—The voice which publishes each hidden motion—[? notion]
And for that end a long pipe down descends,
—Which here it self in many lesser spends—
Untill low at the foot of Cephal mount it ends."—IV, 32.

In verse 33 we meet another curiosity—"the unmoved gristle" of the larynx (cricoid?) often double in women.

"Upon the top there stands the pipes' safe covering,
Made for the voice's better modulation:
Above it fourteen carefull warders hovering,
Which shut and open it on all occasion:
The cover in foure parts, it self dividing,
Of substance hard, fit for the voice's guiding;
One still unmov'd—in Thelu double—oft residing."—IV, 32.

Canto V takes up the head-citie.

"Foure severall walls, beside the common guard,
For more defence the citie round embrace:"—V, 11.

"The other two of matter thinne and light;
And yet the first much harder than the other;
Both cherish all the Citie: therefore right
They call that th' hard, and this the tender mother.
The first with divers crooks and turnings wries
Cutting the town in foure quaternities;
But both joyn to resist invading enemies."—V, 12. [Brain membranes.]

Fletcher's knowledge of the brain, of the eye (the latter well described) as well as other parts of the head were undoubtedly drawn from the Greeks. The verse on the ear bones is particularly apt.

"The first an hammer is call'd, whose out-grown sides
Lie on the drumme; but with his swelling end
Fixt in the hollow stithe, there fast abides:
The stithe's short foot doth on the drumme depend,
His longer in the stirrup surely plac't;
The stirrup's sharp side by the stithe embrac't,
But his broad base ti'd to the little window fast."—V, 43.

The Labyrinth was well known, but apparently was supposed to contain air. Otherwise the mode of hearing was relatively well understood, as illustrated by the next two verses—taken, I believe, almost wholly from Galen, who, according to Puschmann gives a similar figure:

"As when a stone, troubling the quiet waters,
Prints in the angry stream a wrinkle round,
Which soon another and another scatters,
Till all the alke with circles now is crown'd:
All so the aire struck with some violence nigh,
Begets a world of circles in the skie;
All which infected move with sounding qualitie.
These at Auditus' palace soon arriving,
Enter the gate, and strike the warning drumme;
To these three instruments fit motion giving,
Which every voice discern: then that third room
Sharpens each sound, and quick conveys it thence;
Till by the flying poast 'tis hurri'd hence,
And in an instant brought unto the judging sense."
—V, 47 and 48.

These are the better verses of Phenias Fletcher's "Purple Island," and show a rather remarkable knowledge of the human body. It is hardly fair to say that Fletcher contributed anything to the art, except perhaps in his wording and his allusions. The description of the mode of hearing especially appeals to me as extremely simple and yet relatively well done. It must be remembered that apart from the Greek school, the only accessible works were possibly those of Sylvius, Vesalius, Fallopius, and Fabricius. That he must have known of the works of these men is to be inferred from the credited discovery of the stapes in 1548 by Ingrassias. It appears, however, quite extraordinary that the other ear ossicles—the labyrinth with its two windows—should have been known long before this time without the stapes being discovered.

The writer begs to acknowledge the kindness of Professor J. W. Bright, of Johns Hopkins University, in calling his attention to the "Purple Island."

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THE SIXTEENTH INTERNATIONAL MEDICAL CONGRESS AT BUDAPEST IN 1909.

The Fifteenth International Medical Congress, held in Lisbon, have chosen Budapest, the capital and residence of Hungary, for the site of their next assembly, and the preliminaries are already in process.

His Imperial and Apostolic Royal Majesty the King has graciously taken upon himself the patronage of the ensuing congress. The state and town have each contributed 100,000 crowns to defray the expenses.

The committee for the organization, execution, disbursements, and reception, as also for the sections is already formed and the statutes are drawn up.

There are 21 sections, each branch of science having a separate section assigned to it.

The date of the opening is fixed for August 29, 1909, and the sessions will be continued till September 4.

There is every reason to presume that the congress will be well attended. Hitherto they have shown an attendance of from 3000 to 8000 participants. Judging from the geographical situation of Budapest, at least from 4000 to 5000 participants may safely be reckoned upon.

The managers, of course, attach the utmost importance to the scientific activity of the congress, and every effort is being made to win over the most prominent representatives of medical science.

The first circular, which will contain every necessary information as well as the statutes, will be ready for circulation in the course of the year 1907. Meanwhile the Secretary-general of the congress (Sixteenth International Medical Congress, Budapest, Hungary, VIII, Esterházy-utcza 7), will have much pleasure in giving information to inquirers.

NOTES ON NEW BOOKS.

The Abdominal and Pelvic Brain with Automatic Visceral Ganglia. By BYRON ROBINSON, M. D. (*Hammond, Indiana: Published by Frank S. Betz, 1907.*)

The present volume contains views concerning the anatomy, physiology, and pathology of the "abdominal and pelvic brain," the former consisting of the solar and epigastric plexus and the latter of the cervico-uterine ganglia located in each side of the uterus.

It is practically a treatise on the abdominal sympathetic nerves, a résumé of views which the author has discussed in current medical literature for a decade and a half. The author states that "a portion of this book entitled, 'Abdominal Brain and Automatic Visceral Ganglia,' was published in 1899 by the Clinic Publishing Company, the copies of which were exhausted in 1904." Portions of this book have also appeared in medical journals such as the Medical Review of Reviews, Medical Age, Medical Brief, Milwaukee Medical Journal, Medical Fortnightly, Medical Review, Medical Record, Medical Standard, Physician and Times, Columbus Medical Journal, American Medical Compend, St. Paul Medical Journal, Central States Medical Monthly, and Mobile Medical and Surgical Journal.

To those who are familiar with the above-mentioned book, "Abdominal Brain and Automatic Visceral Ganglia," or the numerous writings of the author in the above-mentioned journals, this present volume needs no introduction; and those who have enjoyed these contributions may be pleased to know that they may now find them collected and thoroughly revised in the present contribution.

The book consists of 671 pages and 207 illustrations by the artist Zan. D. Klopper. There are forty chapters, including one on "Shock," by Dr. Lucy Waite.

Each chapter is complete, in itself, on the subject of which it treats, and this has led to unavoidable repetition both in text and illustration.

It is impossible to give a résumé of the various subjects treated in so many chapters, and if one wishes to become acquainted with them, they must be read. This volume is in keeping with the other works of the writer, such as "Landmarks in Gynecology" and "The Peritoneum, its Histology and Physiology."

The American Illustrated Medical Dictionary. By W. A. NEWMAN DORLAND, A. M., M. D. 4th edition, revised and enlarged. (*Philadelphia and London: W. B. Saunders Company, 1906.*)

In size and general appearance this new edition of Dorland's dictionary resembles closely Gould's The Practitioner's Medical Dictionary, which has appeared recently. Although there are fewer pages in Dorland's work, the page is a little larger, so that probably the number of words in both is about equal, but Dorland's is somewhat the heavier, and, therefore, less easy to handle. It opens readily at any page like Gould's, and the type is almost the same. As a product of Saunders Company's press it is excellent, and to be recommended as one of the best medical dictionaries. This last edition contains 2000 more words than its predecessor, and six additional colored plates. That a new edition has been called for, shows the popularity of this book which is entirely justified in every respect. An English medical dictionary to equal the French work of Littré has yet to be written, however.

R. N.

Morat (J. P.) Physiology of the Nervous System. Authorized English edition. Translated and edited by H. W. SYERS, M. A., M. D. (Cantab.). With 263 illustrations (66 in colors). pp. i-xxviii and 1-680. (*Chicago: W. T. Keener & Co., 1906.*)

This volume, a portion of Morat and Doyen's Treatise on Physiology published separately, deals with the functions of the nervous system. The book is a noteworthy addition to neurological bibliography and deserves and, we doubt not, will receive a warm welcome.

After a few introductory pages in which innervation in general is discussed and the relations of sensibility to energy, determinism, organization, and excitability, respectively, are referred to, the author gives the clue to the plan of his book and the basis upon which he subdivides his materials. In the nervous tissues, though they are composed primarily of cells, the interrelations of the cells is such that a genuine systematization is displayed. The study of the physiology of the nervous system may, therefore, be prosecuted from two points of view: "one, in which the functions common to all its elements are considered (*cellular functions*); the other, in which the functions special to the groups or systems formed by these elements are taken into account (*systematic functions*)." Morat, therefore, divides the contents of the book into two great parts: I, Elementary Nervous Functions; and II, Elementary Systematic Functions. Since the author adopts the neurone doctrine, fully making, as is the custom of American writers, *nerve-cell* (including all its parts) and *neurone* identical terms, his subdivision is the equivalent of a subdivision into I, The General Functions of Neurones, and II, The Functions of Neurone-Systems.

In the first part of his treatise, after distinguishing between the static or anatomical unit (the neurone) and the dynamic or physiological unit (the elementary nervous irritability, or aggregation of energies originating in the neurone), the writer plunges into his subject-matter proper and in the first chapter discusses "The Nervous Element" (anatomical data, dynamic condition, stimulation of the nerves, laws of electrical stimulation); in the second chapter he develops the doctrine of the "Energies of the Nerve."

In the second part, which is much the larger, there are two sections. The first section deals with Nervous Organization. There are four chapters in the section: (1) Sensibility and Movement; their Relations; (2) Primary Systematizations (Reflexes); (3) Consciousness and Unconsciousness; and (4) Superior Systematizations (Orientation and Equilibrium, Emotions, Intelligence, Cerebral Localizations). The second section deals with Specific Innervations, in five chapters: (1) Tactile Innervation; (2) Visual Innervation; (3) Auditory Innervation; (4) Olfactory and Gustatory Innervations; (5) Language and Ideation.

The matter is too extensive to lend itself well to brief critical review. The author has made an excellent book, and one which every working neurologist should be glad to have at his elbow. There are some defects one would like to see corrected, as for instances, (1) an apparent lack of familiarity with the newer work on heart-block in evidence in the chapter on innervation of the heart and (2) the sections dealing with motor localization in the cortex.

The author is to be congratulated upon his valuation of psychological work for cerebral physiology and one can only lament that he has not gone even farther than he has in this direction. He might well have brought in more of the results reached by his countrymen Ribot, Binel, and Janet.

The translator has not had an easy task but on the whole he has performed it well. The style is pleasing and dignified. An occasional split infinitive has crept in and here and there a misprint (e. g. Munck for Munk) mars a page, but these are trifling errors nearly always discoverable in a first edition. The thanks of English and American neurologists are due the publishers for

undertaking the issuance of a book which is more likely to help science than to increase their bank account. L. F. B.

The Treatment of Syphilis. By ALFRED FOURNIER. English Translation by C. F. MARSHALL. (*London and New York: Rebman Company, 1906.*)

The English translator has done justice to this classical work and it is, even in the new tongue, charming reading. One is tempted, indeed, after reading Gallic treatises, to suggest that a division of labor according to which the Germans made and recorded observations, the English drew deductions and the French wrote the text-books, would be a wise one. Fournier has, however, done more than write a crisp and entertaining text-book; he has brought to his task an enormous experience with syphilis and an unusual ability for analyses and clinical interpretation; furthermore, he has had all the problems of syphilis, social as well as medical, on his mind and has thought about them to good purpose. For these reasons, this book is one of definite value; that it is one of the books every medical student should have read, is hardly too much to say. In rendering it available for English physicians Dr. Marshall has not avoided all the pitfalls. On the whole, the book reads well; but one notices here and there the roughness of literal translation where accuracy could have been preserved and attractiveness enhanced by a legitimate freedom. The translator's persistency in having every "*mais*" represented by an English "*but*" is an example of conscientiousness at the expense of charm.

There are probably not more typographical errors than should be expected in a second edition. One notices, among others, "suphurous acid" (p. 92) and the "serious" nasal discharge of iodism in contradistinction to the muco-purulent discharge of coryza.

Introduction to Infectious and Parasitic Diseases Including Their Cause and Manner of Transmission. By MILLARD LANGFIELD, A. B., M. B., etc. (*Philadelphia: P. Blakiston's Son & Co., 1907.*)

The author states in his preface that "formerly this book was written for the use of nurses," but the original design was somewhat altered, so as to embrace both physicians and students of medicine, and the following sentences from the Introductory Note by Lewellys F. Barker, Professor of Medicine at the Johns Hopkins University, are sufficient to indicate the worth of this book. He says: "I have had the opportunity of reading the chapters before they went to press, and have no hesitation in recommending the book to the class of readers for which it is intended. The presentation is simple and clear and the author has carefully avoided the use of terms and the discussion of questions which would be unintelligible to beginners in the subject."

The book is divided into ten chapters on the Cause of Disease, Bacteriology, Phenomena of Infections, Inflammation, Animal Parasites, Avenues of Exit (2), and Portals of Entry (2), Disinfectants and Disinfection, Collection and Examinations of Secretions and Excretions, with an appendix, a good index, and thirty-three illustrations. It is well printed and will undoubtedly prove of use to many who do not desire more profound knowledge of the subjects treated. R. N.

A Text-Book of the Practice of Medicine. By HOBART AMORY HARE, M. D., B. Sc., Professor of Therapeutics in the Jefferson Medical College of Philadelphia, etc. Second edition, revised and enlarged. (*Philadelphia and New York: Lea Brothers & Co., 1907.*)

The well-known name and writings of the author both in therapeutics and internal medicine insure the favorable reception of this volume. The arrangement and classification of the diseases is very good, although much the same as that used in other works of a similar character. In treating each disease separately the author has been most consistent in the arrangement of his subject-matter, using a very logical order throughout.

In regard to the reading matter, in the main it is more or less a facsimile of other books of the same character. Although the pathology of some diseases is very full and complete in others much has been left to be desired. On the other hand, the symptomatology and treatment are presented on the whole in a clear and thorough manner. But as the author states in his preface, "Much information that might be included, which deals with subjects which are still uncertain and debatable, has been excluded." Although this is a very laudable aim of the author, yet there are some instances where a more exhaustive discussion of these "uncertain" subjects might have done much to help the student grasp the characteristics of disease.

The chapters on Tropical Diseases are excellent for a book of this kind where the student and practitioner will find sufficient information to help him recognize rare conditions. In dealing with the diseases of the Nervous System the charts and illustrations employed are excellent, going far to establish a clear understanding of the pathology and symptomatology.

From a statistical point of view much material has been brought forward in a very clear and easily assimilable form. This is especially true in the acute infectious diseases as scarlet fever, diphtheria, and acute pneumonia.

The printing and binding are good and may be said to be somewhat above the ordinary. In fact, the present volume of this work is a worthy successor of the first edition. And it should take a prominent position amongst books of a similar class, in which there are so few better and many worse. J. C. M.

Clinical Diagnosis. A Text-Book of Clinical Microscopy and Clinical Chemistry for Medical Students, Laboratory Workers, and Practitioners of Medicine. By CHARLES PHILLIPS EMERSON, A. B., M. D., Resident Physician, The Johns Hopkins Hospital; Associate in Medicine, The Johns Hopkins University. (*Philadelphia and London: J. B. Lippincott Company.*)

This valuable volume deals with the systematic study of the sputum, urine, stomach contents, fæces, blood, and the various body fluids in the order named. There is a short introduction by Dr. Osler, who emphasizes the great importance of every medical student and practitioner being familiar with clinical laboratory methods and with their practical application in the study of disease at the bedside. Emphasis is also placed on the importance of a well-organized clinical laboratory as a part of the necessary equipment of a modern hospital and medical school.

There is more originality manifested by Dr. Emerson in the preparation of this book than has been shown by any other writer of a volume dealing with the same subject-matter that has appeared in recent years. This is particularly well shown in the illustrations, nearly all of which were made by a competent artist from observations personally made by the author in the wards or during class demonstrations in the clinical laboratory. It is rather refreshing not to find the hackneyed illustrations that have long served the purpose of the writers of similar works.

In a volume, all the sections of which are of such a high order, it is difficult for one to individualize. In the opinion of the reviewer, however, the section on the urine is preëminently the best. This would be expected naturally from one who has had such a good chemical training, and who has done such good work in the study of metabolism.

Early reviews of books are usually desired both by the author and publisher. Most books are reviewed before they have stood the test of time and experience. This is not true in the case of the present review. Sufficient time has elapsed, since the appear-

ance of the volume several months ago, for it to have been subjected to the best possible test, namely that of practical use. No similar work in recent years has stood the test so well. The author has wisely refrained from including numerous methods, chemical or otherwise, which are too often given in similar treatises, and which are of little practical value. The volume is essentially practical, and is invaluable to the student or practitioner.

Stöhr's Histology; arranged upon an embryological basis. By Dr. Frederick F. Lewis. The sixth American edition; from the twelfth German edition. (*Philadelphia: P. Blakiston's Son & Company, 1906.*)

Great credit is due an author or translator who first attempts to fill a need in the teaching of some subject, and a text-book which fills this need should not fail of a hearty welcome. In the translation before us we have such an attempt. The original text has been modified and amplified by the translator in order to "arrange the book upon an embryological plan." To accomplish this commendable purpose, the translator has given a clear but very brief outline of the development of most tissues and organs before considering their histological structure. The developmental summaries are occasionally further supplemented by a short description of the gross anatomy of the adult organs.

For presenting the subject of histology from an embryological standpoint the translator deserves the gratitude of teachers of histology. However, as to how far a mere summary of the developmental history of organs can acquaint the student or the physician without previous training in embryology, "with the developmental possibilities of their constituent tissues" is a matter of individual opinion. Since the translator does not intend at all to displace text-books in embryology, it is only fair to assume that the student and the physician will be prompted to refer to these by the translator's praiseworthy presentation of the subject of histology.

As to how faithfully the translation represents the twelfth German edition of Stöhr we must let the introductory note of the German author indicate, since the last German edition is not at our disposal for comparison. It is clear, however, that we have before us a composite of two ideals of a text-book of histology, and we do not doubt that the translator's ideal would have found fuller realization in a text-book written entirely by himself.

We regret that matters which are still *sub judice* are occasionally presented in a dogmatic way and that references to articles have not been substituted for, or added to, those of individual investigators. The former would tend to cultivate the proper attitude of mind on the part of the student towards scientific problems, while the latter would encourage him to consult the literature on subjects still under discussion.

The volume is divided into two parts. The first part is composed of three chapters on microscopic anatomy, and the second part of twenty pages contains directions for the examination and preparation of tissues and the use of the microscope. In the three chapters of the first part, the subjects of the cell, the tissues and the histology of the various organs are discussed in the manner indicated above. The text is clear throughout and without the obscurities so apt to characterize translations. The BNA is used consistenly, though Latin and English terms are frequently used in the same sentence. Examples of this are: p. 280, ductus ejaculatorii and seminal vesicles; p. 322, bulbus and bulb. The hyphen, too, has been used rather inconsistently as the following instances illustrate: p. 100, intercellular, inter-fibrillar; p. 106, knob-like, semifluid; p. 126, thick walled; p. 128, rod shaped; p. 133, text-books; p. 142, bell shaped; p. 148, well defined; p. 162, thin walled; p. 263, inpocketing; p. 266, out-pocketing; p. 284, C shaped; p. 285, outpocketing; p. 297, mucus-producing; p. 298, kerato-hyalin; p. 316, keratohyalin; p. 330, funnel shaped; p. 331, interrenal; p. 332, well fixed; p. 333, long-meshed; etc. Some of these obviously are typographical errors. It may also be noted that since both the English and metric systems of measurement are used in the text, such an abbreviation as *gr.*, for example (p. 410), is uncertain for the beginner since it usually stands for grain and not for gram.

As a piece of bookmaking, the volume compares very favorably with current American text-books. The type is excellent, the illustrations good and numerous, and the diagrams which supplement them usually clear and well-conceived. The legends are printed in differential type and consequently easy to use, and the index is carefully made. The interpolated parenthetical words and remarks are of much value to the student, save where they convey such useless fancies as that of Holmes, to the effect that the sudoriparous glands resemble a fairy's intestine. This figure may be considered of doubtful value and probably transcends the imaginative power of most students—and histologists. We refer students to the wise words of Sir Benjamin Brodie and John Tyndall upon the scientific use of the imagination. The typographical errors are few. The following may be noted: Fig. 26, *de;* Fig. 32, omission of (a); p. 39, connectve; p. 90, know(n); p. 163, civinity; Fig. 425, areria, and p. 499, *is* for *it*. Attention may also be directed to the following phrases: p. 157, lymphatic vessels . . . . become involved in the lymph sinus; p. 187, parotid gland is an organic gland; p. 279, honeycombed with folds; p. 308, umbilical cord is a pearly rope of tissue; p. 402, wash for an hour or a few days; p. 408, slides rubbed with albumen; and to the fact that the percentages of alcohol as given on pp. 401 and 403 are only approximate.

These matters of textual criticism should be regarded as purely subordinate, however, and do not seriously affect the value of a well-written text-book with copious, clear illustrations, presenting the main facts of the subject of histology from an embryological standpoint.

A. W. M.

A Treatise on the Principles and Practice of Medicine. By Arthur E. Edwards, M. D., Professor of the Principles and Practice of Medicine and of Clinical Medicine, in the North Western Medical School, Chicago, etc. (*Philadelphia and New York: Lea Brothers & Co., 1907.*)

Probably the feature that impresses one most strongly in going over this work is the immense amount of detailed information which the author has collected. Throughout the work he has apparently made the effort to bring together the fullest information on various points rather than to attempt to give a more or less general picture. We are all familiar with the difficulty in teaching which comes from the tendency of the student to always associate a certain picture with a special disease. Doubtless the method which Dr. Edwards has pursued will tend to neutralize this, but of course the best method is for the student to learn the clinical features from the patient.

On the whole, it may be said that Dr. Edwards has written a very satisfactory text-book. Certainly the careful way in which he has studied the literature makes the articles especially useful for teachers and practitioners. He has added a great many historical notes which add to the interest. Necessarily these are brief, but appeal strongly to those of us who are interested in the historical side. There are some of these, however, to which exception may be taken. Thus, it is hardly correct to say that typhoid fever was first recognized by Louis. He drew special attention to the fact that in a certain group of continued fevers there was ulceration of the bowel, just as Bright and others had done, but this can hardly be termed the recognition of the disease. Nor is it correct to say that Brettoneau first noticed specific changes in the intestines in typhoid fever. The essential lesions

in the bowel had been noted long before his day, and he did not separate them from those of enteritis. There is some discrepancy in the note of the discovery of choroidal tubercles in tuberculous meningitis, which is probably an oversight. On page 316 it is stated that they were "first found at autopsy by Nanz (1857), Nusch and Cohnheim, and clinically by von Graefe (1857), and Leber," while on page 1051, it is said that they "were first found anatomically by Autenrieth (1808), and Guéneau de Mussy (1837), and clinically by Jäger, Manz, and Busch."

The sections on the symptoms and physical signs are especially good. In many of these the number of facts and statistics grounded together is really remarkable. This is well seen, for instance, in the section on aneurism of the thoracic aorta. This feature will render it especially useful as a work of reference. The author's sections on treatment are to be fully commended, and measures other than giving of drugs receive proper attention.

The section on the diseases of the nervous system seems to be very well done. It is rather difficult to understand why cerebro-spinal meningitis is placed here and it would seem better among the infectious diseases. We question whether the physicians in the South would agree that neurasthenia is more common in northern climates. It is perhaps difficult to give exact figures, but judging from experience here, it is *by no means rare* south of Mason and Dixons line.

There are, however, a good many points in which we should suggest improvement. There are those who do not think that attention to form in medical writing is worthy of any special attention. Many of us, however, are in agreement with Professor Allbutt in his plea for more care in writing, even if we can only follow him afar off. Thus, we find that "a certain per cent of unoperated cases die." Is it not the patients who die and not the cases? Then again, comes the expression "successfully operated," which would sound better if another word was added. It seems as if the plea for the proper use of the term rheumatism needed to be repeated when we find a new text-book of medicine speaking of "gonorrheal rheumatism" and also of "scarlet rheumatism." In association with arthritis there is some doubt of the correctness of the view that chronic follows acute rheumatism. In the description of arthritis deformans we should not agree with the author that the acute type is uncommon; it is frequently unrecognized.

While we have dwelt on many of the points that might be improved, it must not be thought the general verdict of this work is other than a favorable one. Dr. Edwards has given us a good text-book. We only wish to point out how the good may be made better. The publishers have done their part well in giving a clear page.

A Treatise on Orthopedic Surgery. By ROYAL WHITMAN, M. D., etc. Third edition, revised and enlarged. (*Philadelphia and New York: Lea Brothers & Co., 1907.*)

The general plan of the third edition of Whitman's Orthopedic Surgery does not differ from its immediate predecessor. The scope of the book has been somewhat widened in order to take up more fully those subjects which have recently claimed attention in orthopedic literature. The pathology and treatment of certain affections have been amplified. The chapter on "Fracture of the Neck of the Femur" has been rewritten and profusely illustrated, and the author has forged into the preventive medicine by pointing out the possibilities of preventing deformities as well as of curing them.

Evidently much thought has been given to the selection of illustrations, which clearly point out the pathology and treatment of the subject considered.

The arrangement of the book is excellent. The subject is presented in a logical and concise manner. Numerous illustrations make it exceedingly valuable as a text-book for those students taking up the subject of Orthopedic Surgery. One feels that he is given the experience of a teacher who has thoroughly digested the material of a large orthopedic clinic, and has given each subject the consideration which its importance demands.

W. T. BAER.

Progressive Medicine. Vol. II. June, 1907. Edited by HOBART AMORY HARE, M. D., etc., assisted by H. R. M. LANDIS, M. D., etc. (*Philadelphia and New York: Lea Brothers & Co., 1907.*)

This digest of "advances, discoveries, and improvements in the medical and surgical sciences" is published quarterly, and is valued by the medical profession because it keeps them well informed of the new work that is being done constantly in all countries. The contributors are men of note in their own lines, and the work is edited in such a manner that it is easy to find the latest information on any branch of medicine or surgery. This volume is devoted to hernia, surgery of the abdomen, gynæcology, diseases of the blood, diatetic and metabolic diseases, diseases of the spleen, thyroid gland and lymphatic system, and ophthalmology. The contributors of the articles are W. B. Coley, E. M. Foote, J. G. Clark, A. Stengel, and C. Jackson. As a work of the publishers, the volume is to be commended, but it would seem as though often the illustrations might be better chosen, and better reproduced.

R. N.

A Treatise on Surgery. By GEORGE RYERSON FOWLER, M. D. Vol. II. (*Philadelphia and London: W. Saunders Company, 1906.*)

This volume belongs to the already large, and daily growing, class of copiously illustrated text-books of surgery. There is about it nothing striking; the arrangement and general treatment of the material are conventional—as, indeed, they must needs be; but a moderately high average is maintained throughout and one misses that lack of balance seen in Systems of Surgery in which certain articles, written by careful and thorough men, are excellent and others, written to fill up space, are wretched. One is struck by the author's wide acquaintance with the literature; the pages are studded with the names of those who have made contributions to surgery; and this extensive review of the field adds value to the book.

Most of the pictures are good; some are excellent; a few are bad. The conventional illustrations have been included, as for example, the views of the various stages of catheterization, though the very important maneuver of putting the assisting hand in the perineum is, as usual, omitted.

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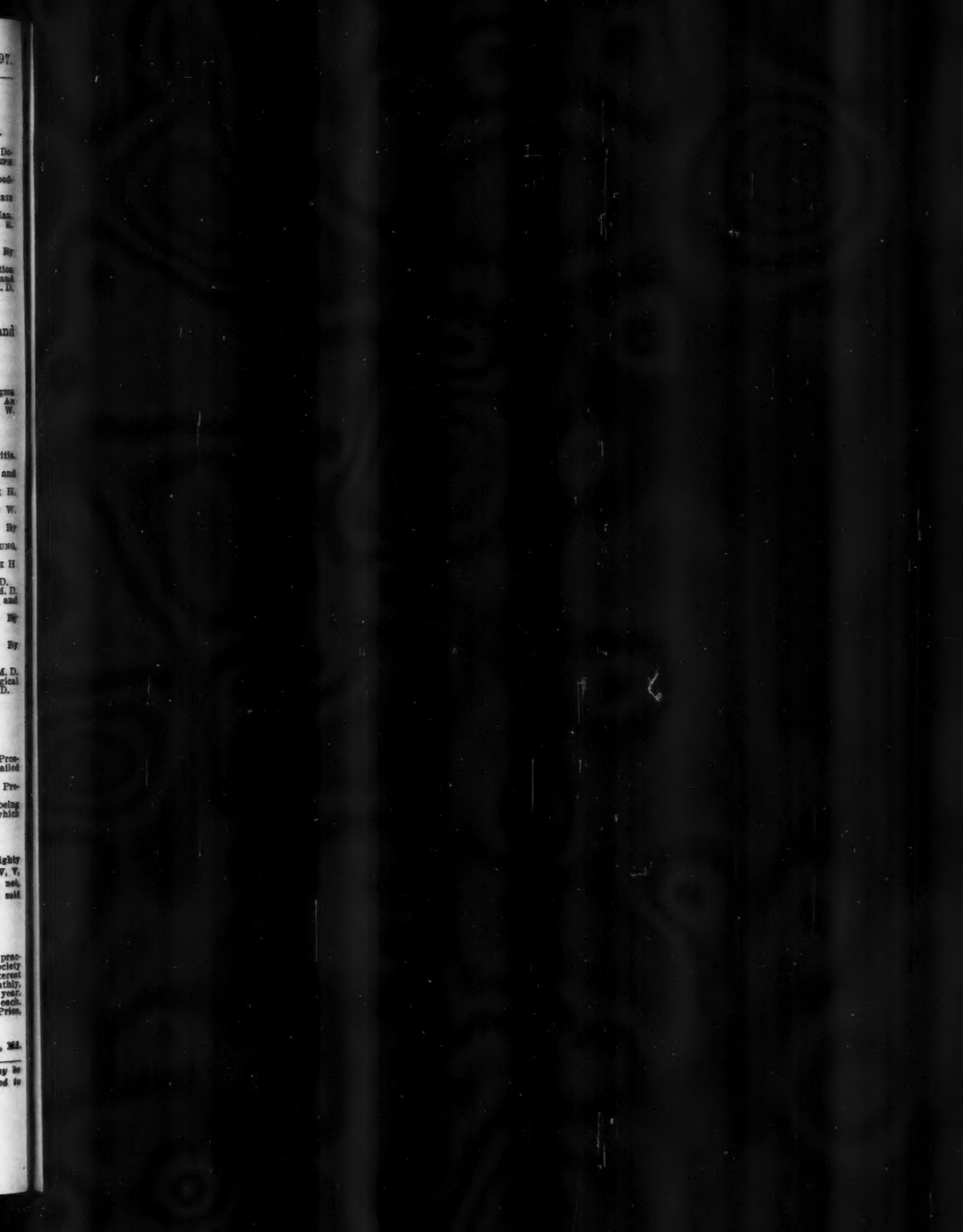
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